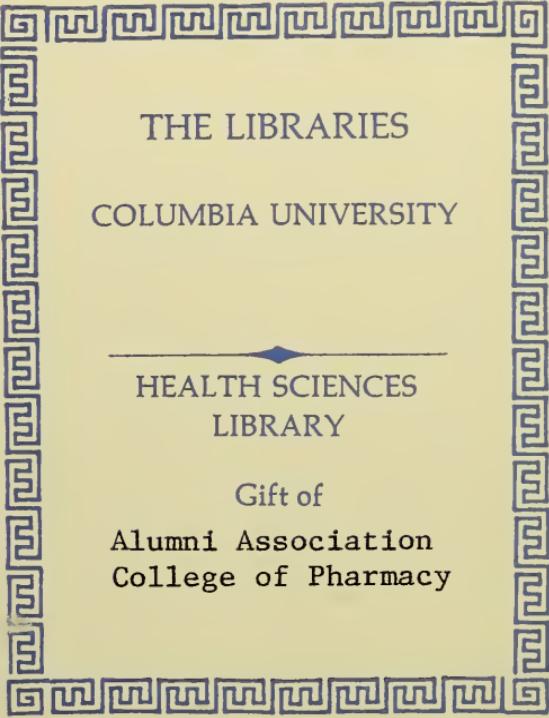




Columbia College
in the City of New York

PRESIDENT'S
ANNUAL REPORT

1894



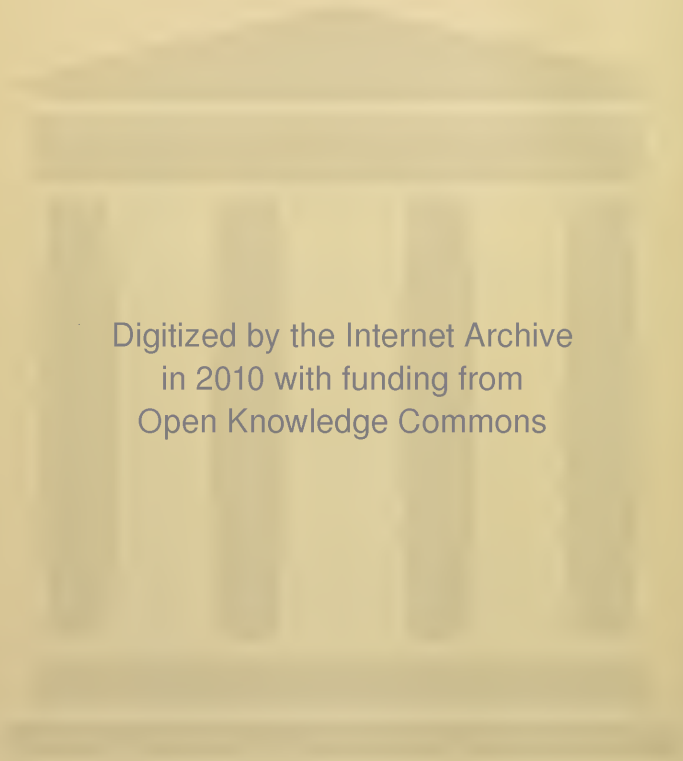
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Columbia College
in the City of New York

FIFTH
ANNUAL REPORT
OF
PRESIDENT LOW
TO THE
TRUSTEES

OCTOBER 1, 1894

NEW YORK
PRINTED FOR THE COLLEGE

1894

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*To the Trustees of Columbia College in the City of
New York :*

I have the honor to submit herewith my annual report for the academic year ending June 30, 1894.

The interval between the closing of the College in June, 1893, and its reopening in October was sadly marked by the death of two distinguished alumni, both of whom had been connected with the government of the College for many years. On the 7th day of July the Hon. Samuel Blatchford of the Class of 1837 died at Newport, R. I. Judge Blatchford had been for more than twenty-five years a Trustee of the College, and since 1882 he had been a Justice of the Supreme Court of the United States. Judge Blatchford never failed to attend the meetings of the College Trustees when the recess of the Court permitted it ; and only a short time before his death he manifested his warm interest in the College by presiding at a meeting held in Washington to organize an alumni association at the capital.

The connection of the Hon. Hamilton Fish with the College was unique. A graduate of the Class of 1827, he was chosen a Trustee for the first time in 1840. Nine years later he resigned by reason of his election as Governor of the State of New York. At the end of his term as Governor, he was again elected a Trustee of the College, in 1851. In 1860 he was

chosen Chairman of the Trustees, and continued in that office until his death, which took place at his home at Garrison on the Hudson on the 7th day of September, 1893. Mr. Fish's services as a trustee thus covered the space of more than fifty years, while for the unbroken term of thirty-three years he was Chairman of the Board. It is safe to say that during all that long period no one was more attentive than he to the duties of the office until failing health a year or two ago compelled him to absent himself from attendance on the meetings. By his will Mr. Fish left a bequest to the College of \$50,000, thus manifesting anew his abiding interest in it, and adding one more significant testimony to the fact that Columbia needs, and can use well, constant accessions to its funds. The Trustees in grateful remembrance of Mr. Fish's public services, as Secretary of State of the United States, have named for him the Hamilton Fish Chair of International Law and Diplomacy. The sum of money generously given by him has been added to the fund for the purchase of the new site.

A year ago I reported that the mortuary chapel erected by the Trustees in the cemetery at Sheffield, Mass., as a memorial of President and Mrs. Barnard, was substantially finished. It was the intention at that time of the committee having the matter in charge also to place a proper monument over the grave where President and Mrs. Barnard were interred. At the suggestion of Mrs. General Barnard, however, the chapel itself has been made their monument; and the President and his Wife are now buried beneath it. Suitable tablets mark the chapel as their memorial.

The most notable incident of the year affecting the

teaching force has been the retirement as an Emeritus Professor, at his own request, of Dr. Henry Drisler, Jay Professor of Greek and Dean of the School of Arts, after fifty years of continuous service of the College. The action taken in recognition of this interesting event gives evidence of the deep feeling awakened by it. Suitable minutes were adopted by the Trustees, and also by the Faculty of the School of Arts, the college proper, of which faculty Dr. Drisler was the dean and with which he had always been identified. Also, by order of the Trustees, a gold medal commemorative of the occasion was struck, and presented to the venerable Doctor at the annual commencement. On the same occasion, a memorial book of classical studies, comprising contributions written by a number of Dr. Drisler's former students, was presented to him. In the meanwhile, apart from these personal evidences of regard and esteem, the Trustees had established, as a permanent memorial of his long and useful connection with the College the Henry Drisler Fellowship in Classical Philology, carrying an annual stipend of \$500. A fund of \$10,000, to be known as the Henry Drisler Classical Fund, for the purchase of equipment for the departments of Greek and Latin, was presented to the College by the President in affectionate remembrance of his old preceptor and friend.

During the year Professor William H. Carpenter has been absent on leave on account of his health. I am happy to say that he expects to be able to return to duty with his health completely restored.

Dr. Abraham Jacobi, clinical professor of the diseases of children in the College of Physicians and

Surgeons, was the recipient during the year of a very great honor. He received an invitation to accept the corresponding professorship in the University of Berlin, to succeed Professor Henock, the chief authority in this department in Germany, who was retiring on account of age. Dr. Jacobi declined the offer; saying that America had done so much for him, he felt under obligations to do what he could for America by the practice of his profession here. This circumstance is interesting as showing that we have in New York one of the first authorities in the world on the diseases of children. It is mortifying to reflect, that, even at the College of Physicians and Surgeons, it has been impossible thus far to give Dr. Jacobi opportunity for clinical instruction at the bedside. The Vanderbilt Clinic does afford the opportunity for clinical instruction in ambulatory cases, but it does not cover the most important part of the field. When one reflects that a very large part of the practice of every young physician is with children, it ought to be clear that here is an opportunity for some benefactor to be of great service to the community. Five hundred thousand dollars, or thereabouts, would build and endow a small hospital adequate for this purpose, which might serve as a beginning. We certainly have in New York two of the three elements necessary for a satisfactory solution of the problem. We have the scientific man to give the instruction. We have the abundant wealth to provide the means. I can scarcely doubt that we have also the generous giver, if only these words come to the attention of the eyes that are ready to see, and the mind and heart that are quick to grasp the opportunity.

Several incidents of educational interest have marked the course of the year. In October, 1893, the College was highly honored by a visit from Professor Dr. von Helmholtz, who addressed the students both at the College of Physicians and Surgeons and at 49th Street. At the College of Physicians and Surgeons, the great physicist gave an account of his discovery of the ophthalmoscope; and at 49th Street, he gave an interesting address on the development of modern science. The notes used in the delivery of this address are now in the library of the College. The privilege of listening to so great a man was highly valued both by the professors and the students, and it is not to be doubted that some permanent inspiration has sprung from this interesting visit. Under the auspices of the Department of Romance Languages and Literatures a successful centennial celebration was held, on March 15, 1894, of the birth of Friedrich Diez, who is recognized as the founder of Romance Philology. As many as twenty-one colleges and universities were represented on this occasion, and the exercises reflected great credit upon the department and the university. The University of Halle-Wittenberg celebrated its 200th anniversary on August 2d, 3d, and 4th. Dr. A. V. Williams Jackson was delegated to represent Columbia on this interesting occasion.

A new departure was made in the award of the Barnard Fellowship for the encouragement of scientific research. Under the terms of President Barnard's will, no one in the graduating classes last year, either of the School of Arts or the School of Mines, seemed to be eligible. The fellowship was therefore

given to Professor Robb, of the Class of 1882, School of Arts, professor of physics at Trinity College, Hartford, Conn., to enable him to complete some definite researches already begun. It is not unlikely that greater scientific results will generally be obtained by granting the fund to a graduate of long standing than can ordinarily be hoped for by assigning the fellowship to a younger man.

An interesting incident of the year occurred in connection with the police census of the unemployed, which was taken by the city authorities. Professor Mayo-Smith, who is the head of the Department of Statistics, volunteered to tabulate the returns obtained by the police officers. The returns came to the College from police headquarters as they were received there. The last bundle came to hand on a Monday, and before the end of the week the results had been transmitted to the Mayor.

The different courses of public lectures offered by the College during the year under review were uncommonly successful. Full details are given in the appendix. Regular courses were maintained from December to March inclusive at the Cooper Institute, the Metropolitan Museum of Art, and the American Museum of Natural History. Besides these, many public lectures were delivered at the College, upon subjects historical and scientific. An interesting course upon The Westward Growth of the United States during the Revolutionary War was delivered by the Hon. Theodore Roosevelt during the early part of the year; and in midwinter a course of three lectures on The Meaning and Use of the Colors of Animals was delivered to the great satisfac-

tion of all who heard it by Prof. Edward B. Poulton, F.R.S., of the University of Oxford. A fine course on Celestial Mechanics was delivered by Dr. G. W. Hill, upon whom the College conferred the honorary degree of Doctor of Laws at commencement.

At the close of the academic year 1892-93, the Trustees authorized the formation of a corporation to be known as the Columbia University Press, to which they granted the use of that name subject to revocation, in case of need, at the option of the Trustees. This corporation has since been formed with the President of Columbia College as its president. Its object is to provide for the printing and publication of meritorious works on all subjects, after the manner of the Clarendon Press at Oxford. It has designated Messrs. Macmillan & Co. as its publishing agents. The first book to be brought out bearing its imprint, very appropriately was "Classical Studies in Honour of Henry Drisler." Already, however, the Press has performed another service of great value to the College. A committee was appointed "to consider and report on the desirability and practicability of securing uniformity and co-operation in the publication of College documents (contributions to literature and science), and of the several journals edited by faculties of the College." As a result of the labors of this committee, all the serial studies and contributions from departments of the College, which hitherto have appeared in all sorts of shapes, will appear henceforth with a certain degree of uniformity in style and caption, so far as that may be possible with contributions covering so wide a range. All of them will have, in common, the effect

of a systematic series of studies embodying the researches of the officers and students of our various departments. In this way it is expected that the College will be recognized, more widely than hitherto, as the seat of original work in many subjects, no effort having been made in the past to connect these different series with each other or with the College. It is interesting to observe how generally our professors are at work in this direction. The following journals are issued under the direction of members of the faculties of Columbia College, or in co-operation with members of other colleges :

The School of Mines Quarterly.		
The Political Science Quarterly.		
Bulletin of the Torrey Botanical Club.		
Bulletin of the New York Mathematical Society.		
Educational Review.	(In co-operation).	
Modern Language Notes.	"	"
American Journal of Archæology.	"	"
Psychological Review.	"	"

The following serial studies and contributions are issued from the College :

- Studies in History, Economics and Public Law.
- Studies from the Analytical and Assay Laboratories of the School of Mines.
- Contributions from the Electrical Engineering Department of the School of Mines.
- Contributions from the Herbarium of Columbia College.
- Contributions from the Mineralogical Department of Columbia College.
- Contributions from the Geological Department of Columbia College.
- Contributions from the Observatory of Columbia College.

Contributions to Philosophy Psychology and Education.

Studies from the Biological Department of Columbia College.

Studies from the Department of Pathology, College of Physicians and Surgeons, Columbia College.

It is said that that is the happiest country which has no history. For the first time since my accession to the presidency we have had a year of quiet work unaffected by any new departure. It has been a good year. By the uniform testimony of the teaching force the *morale* of the students never has been better, they have never done better work, and, tested by any analysis that figures afford, the results have been highly satisfactory. There is evidence, I think, that the great development of the university which has taken place is becoming widely known, and I cherish the hope that a tide has set in toward Columbia, only the small first effects of which have yet been felt. The student membership of the university reveals a gratifying growth. It was, in

1891-92	1573
1892-93	1641
1893-94	1805

The following table shows that the gain comes from all quarters of the Union, and that the gains from a distance are, both absolutely and in percentage, in excess of local gains.

FROM	1892	1893	1894
New York City	746	761	835
Brooklyn	162	164	170
	<hr/>	<hr/>	<hr/>
	908	925	1005

	1892	1893	1894
Brought Forward.....	908	925	1005
New England States.....	94	94	100
Middle States.....	399	416	481
States north of Ohio River and east of Mississippi River....	46	52	69
States south of Ohio River and east of Mississippi River....	48	60	55
States west of Mississippi and east of Rockies.....	29	40	47
States west of Rockies and on Pacific Coast.....	18	27	26
	<u>1542</u>	<u>1614</u>	<u>1783</u>
Foreign countries.....	31	27	22
	<u>1573</u>	<u>1641</u>	<u>1805</u>

	LOCAL.	GENERAL.	TOTAL.
Domestic gain of 1894 over 1893....	80	89	169
“ “ “ “ “ 1892....	97	144	241

It is a fair inference from these figures that Columbia's national reputation is on the increase. The increase in numbers is the more gratifying because in several of our schools we have made changes that in effect compel us to develop a new constituency. This is admittedly true of the Law School, which formerly contributed a very large membership to the student body. In 1890-91, with a Law School of 609, the students of the university numbered 1756. In 1893-94, we have 1805 students in the university with a Law School of 248. In 1890-91 there were besides, 16 seniors studying law, and in 1893-94, 20 seniors.

The School of Arts also is developing a new constituency in the sense that the standard for admission to the college has been so greatly advanced as to necessitate much more thorough preparation. It takes preparatory schools a year or two to adapt themselves to such a change, and in the meanwhile

students who may have expected to come to Columbia find themselves unable to do so.

In the School of Arts, the new curriculum has now been in operation for two years. It has commended itself thoroughly. In the sophomore year the students have a single choice. They may take chemistry, with laboratory work, in lieu of any language except English. The following table shows the choices actually made :

	In 1892-3 73 in class.	In 1893-4 60 in class.
Greek was taken by.....	40	36
Latin " "	61	54
French " "	43	34
German " "	27	24
Chemistry" "	48	32

	1892-3	1893-4
Chemistry in place of Greek.....	33	24
" " Latin.....	12	6
" " French.....	1	1
" " German	2	1

In the junior year the new curriculum differs from the old only in a large extension of the elective system. At this stage of the student's progress this enlargement is believed to be wise. Without dissent, so far as I know, the testimony of all the instructors is favorable to the change. The students are more earnest, they work harder, and in each subject more is accomplished.

The system of permitting seniors to study under any university faculty has been in operation for three years. Some minor regulations are under consideration, but as a whole the plan has proved an unqualified success. It has completely changed the attitude of

the seniors to their work, making it impossible to imagine, in the language of one of our oldest professors, "happier conditions under which to teach." A very significant illustration of the effect of the system is seen in the increasing number of Columbia graduates who remain in the university after receiving the first degree. Of such graduates there were, in

1892.....	80
1893.....	86
1894.....	102

The following table shows, by faculties, the elections made by the seniors in each of the three years :

Number in Class.....	38	65	65
FACULTIES.	1891-2	1892-3	1893-4
Law.....	12	13	20
Medicine.....	—	6	9
Mines (including Pure Science)	23	32	—
Mines (without Pure Science).	—	—	4
Pure Science.....	—	—	25
Political Science.....	21	24	19
Philosophy.....	33	52	45

The medical faculty was not open to choice in 1891-2. Pure Science was set off from the School of Mines, the representative at Columbia of applied science, in 1892-3, so that it appeared for the first time as a separate faculty in 1893-4. In other words the seniors who elected subjects in natural and exact science during the three years, were, in

1892.....	23
1893.....	32
1894.....	29

Of those who studied law and medicine it is interesting to know that a considerable proportion did so

without expecting to practise. These latter, in some instances, elected simply certain medical or legal subjects allied to their other studies. The figures are as follows :

	1892		1893		1894	
	Law	Medicine	Law	Medicine	Law	Medicine
Intending to practise .	6	—	10	6	13	6
Not “ “ “ .	6	—	3	—	7	3
	—	—	—	—	—	—
	12	0	13	6	20	9

The growing tendency to concentrate is shown by the following table :

	1892	1893	1894
Number working entirely under one faculty.....	3	15	31
Number working under two faculties.....	20	38	45
Number working under three or more faculties.....	15	12	7

The increasing number of students admitted on certificate from other colleges seems to indicate a growing appreciation of the advantages now offered by Columbia in its undergraduate course. For the last three years the figures are as follows :

	1891-92	1892-93	1893-94
To Freshman Class... ..	1	5	2
To Sophomore “	4	4	4
To Junior “	4	3	3
To Senior “	1	4	8
	—	—	—
	10	16	17

Some have feared that Columbia's tender in throwing open all the faculties of the university to members of the senior class would lead a large proportion of such students to join the college for the senior year only, and then for the sake of saving a year on some professional course. Thus far, it appears that, out of the 43 students admitted from other colleges in the last three years, only 13 have joined the senior class. Of this number only 7 have taken professional courses. Twenty-one different colleges have furnished the students admitted on certificate.

Reference has already been made to the reorganization of the Law School. It is now possible to present statistics for the three years since the reorganization was effected.

	1891-92	1892-93	1893-94
Men in the school holding Columbia College degrees	17	22	20
Men in the school holding other college degrees....	91	85	94
	<hr/> 108	<hr/> 107	<hr/> 114
Columbia College Seniors...	14	13	20
	<hr/> 122	<hr/> 120	<hr/> 134
Percentage of the whole school.....	40%	45%	50%
Total number in school....	318	266	270

In 1890-91 the total number in the school was 625. Of these 245 held degrees and 16 were seniors in the School of Arts. These two classes of students formed 40 per cent. of the whole number. These figures show that the first effect of the change was

to cut down the school by one half. Singularly enough the greatest effect was not felt in the first year after the change, but in the second year. Happily the third year furnishes evidence that the tide has turned. The incoming class in each year is a better criterion than the total membership, because, until the end of 1892-3, there remained in the school the fragments of the classes which were there at the time of the reorganization.

ENTERING CLASS.	1891-92	1892-93	1893-94
College graduates.....	41	43	45
Seniors in Columbia College	14	13	20
Other students.....	79	60	72
	<hr/>	<hr/>	<hr/>
	134	116	137

These figures are even more significant than they seem, because the entrance requirements have been materially advanced since 1890-91. Admission to the school now implies at least a high-school education. By comparison, also, it appears that the entering class in 1893-94 in the only other school on a similar basis was smaller than in the previous year, owing, presumably, to the hard times. It appears, therefore, that there is already manifest in the school a tendency to grow, and especially is it true that the school is attracting to itself a larger percentage of broadly educated men. This is precisely what was hoped for.

The appointment of two new professors of law who enter upon their duty in the autumn of 1894, is an event of much importance in the history of the school, and of great significance in its bearing upon

the ideals of the university, inasmuch as no change is contemplated in the curriculum of the school. It is a clear indication that the Trustees look to their professors to be producers as well as teachers, and that they believe the best teachers are likely to be those who have time at their command for study and research. The gentlemen appointed to the new law chairs, Messrs. Henry P. Starbuck and George F. Canfield, have given acceptable instruction in the school as lecturers, for a longer or shorter period. They are both successful members of the New York Bar.

In the Medical School, the College of Physicians and Surgeons, the year has been one of great prosperity. The enrolment of students numbered 766, a gain of 112 on the previous year. This very large increase is doubtless due in part to the fact that the medical course, now three years, becomes a four-years' course in October. It would have been impossible to have given the prescribed instruction in anatomy to the large number of students demanding it, except for the arrangements which had been made for artificially cooling the dissecting room. This room was thus made available for teaching six weeks longer than usual. The Dean says in his report, "The establishment of an orthopedic department in connection with the Chair of Surgery—under the care of Dr. Gibney as lecturer and Dr. Whitman as instructor—marks an important onward step in the surgical teaching of the College." The faculty have given much time and thought during the year to the development of the four-years' curriculum. As finally adopted it is notable for two things; for the great increase of clinical instruction available

to students in small groups, and for the introduction of elective courses in the fourth year. The subjects from among which such election is to be made include some branches not distinctly medical in character ; as, for instance, philosophy and psychology. The instruction in practical physics is to be given in the physical laboratory of the university at 49th Street and Madison Avenue.

In presenting the growth of the School of Mines comparison can be made only between the last two years, because a certain number of students formerly credited to the School of Mines are now reckoned with the School of Pure Science. Thus all seniors in the School of Arts are held to be studying in the School of Pure Science.

	1892-3	1893-4
Men holding Columbia College degrees..	8	9
Men holding other college degrees.....	41	43
	—	—
	49	52
Percentage of school.....	14½%	13¼%
Total school.....	337	380

The changes in the organization of the chemical department, detailed last year, have yielded satisfactory results. The various engineering departments, also, and the department of mechanics, give evidence of improving conditions growing out of the recent reorganization. The professor of mining reports that, as a result of the establishment of that department three years ago as an independent department, there were delivered in 1893-4, 308 lectures on mining, as against 205 in 1890-91, and 110 in 1886-7. Much important apparatus also has been collected.

The professor of mining thinks that these changes place the School of Mines in the front rank in the opportunities offered for the study of mining. Dr. Eggleston, Professor of Mineralogy and Metallurgy, had a sharp attack of illness shortly before Christmas which proved so severe as to keep him away from his duties at the College for the remainder of the academic year.

The School of Political Science has prospered during the year. The following table gives interesting statistics for the last three years :

	1891-2	1892-3	1893-4
Men holding Columbia College degrees	22	22	19
Men holding other college degrees	67	67	80
	<hr/>	<hr/>	<hr/>
	89	89	99
Columbia College Seniors.....	39	32	40
	<hr/>	<hr/>	<hr/>
	128	121	139
Percentage of school.....	60%	70%	60%
Total school.....	211	174	226

The thorough work done in this school is beginning to obtain wide recognition. During the year under review no less than five of its recent graduates have received professorial appointments in colleges ranging from Maine to Colorado. Another has been appointed as instructor, and still another as lecturer. The Series of Studies in History, Economics and Public Law, consisting of selected dissertations written chiefly for the degree of Doctor of Philosophy, continues to be self-supporting. One of these papers published during the year, a paper, by the way, written

for the Master of Arts degree, "The Colonial Policy of England toward the American Colonies," by George L. Beer, A.M., was recently complimented by Lecky in a public address, as a treatment of the subject not surpassed, to his knowledge, for intelligence and fair-mindedness. The work of the Faculty of Political Science is to be enlarged next year through the recent appointment of Professor Franklin H. Giddings as Professor of Sociology. The liberality of the Chairman of the Trustees, at the same time, has made it possible to provide an adequate library for the commencement of this work. Professor Giddings has lectured at the College once a week, for several years, and we anticipate much advantage from his complete identification with the university. It is intended to take advantage, so far as possible, of the special opportunities for sociological study incident to our location in the City of New York.

The School of Philosophy shows a gratifying growth, as appears by the following table :

	1891-2	1892-3	1893-4
Men holding Columbia College degrees	16	17	28
Men holding other college degrees	40	45	64
	<hr/> 56	<hr/> 62	<hr/> 92
Columbia College Seniors.....	41	58	55
	<hr/> 97	<hr/> 120	<hr/> 147
Percentage of school	75%	92½%	90%
Total school	130	130	165

The number of courses offered by this faculty during the year was 85, an increase of 15 courses over the

preceding year. By the report of the Dean it appears that 80 per cent. of the senior class in Arts choose subjects in philosophy, philology and letters, and therefore come under this faculty. This is gratifying, as it shows the strong hold of the humanities even upon students free to select their work under any university faculty. This faculty was established only four years ago. In its first year it offered 38 courses and attracted 92 students of all grades. Its growth is very gratifying, and reflects great credit upon all who have helped to bring the work of the faculty to its present high state of efficiency.

The Faculty of Pure Science was established in 1892 in the hope of developing at Columbia a study of science less completely professional than that which is characteristic of the School of Mines. That it is succeeding appears in part from the following figures:

	1892-3	1893-4
Men holding Columbia College degrees	8	11
Men holding other college degrees	7	20
Columbia College Seniors	37	29
	—	—
	52	60
Percentage of school	88%	90%
Total school	59	67

But better, as evidence, than any figures, is the report of the Dean, which reveals in every line an intelligent and earnest development of all the branches falling within the scope of this faculty.

A year or two ago the trustees subscribed for a table at the Marine Laboratory at Wood's Holl in the interest of the Department of Biology. They have now subscribed for a second table in the inter-

est of the Department of Physiology. These tables are used by professors and students all through the summer season.

Mr. Arthur Willey, who has been tutor in biology during the last two years, has received the flattering appointment to the Balfour Studentship of the University of Cambridge, England. This is one of the most coveted appointments for scientific research in England, and Mr. Willey was chosen from among a large number of competitors. He will be sent for three years, aided probably by a grant from the Royal Society, to investigate the embryology of the pearly nautilus, found near New Guinea.

Reference was made last year to the assignment to this faculty of the professor of physiology. The medical representation in the faculty has been further strengthened by the assignment to it this year of the professors of anatomy and bacteriology. This secures for these medical subjects close relations with their allied themes of biology, palæontology, and the like ; while it helps to keep alive in these medical departments a spirit of research that will not be satisfied simply with giving instruction for the professional degree in medicine. So long as our large professional schools consist in great part of students who have not had a broad preliminary training, some such device as a separate faculty for the encouragement of pure science is likely to prove useful.

A summary of the most interesting statistics concerning the university as a whole is presented herewith. For further details, and for further particulars concerning the several schools, attention is asked to the appendix to this report and to the reports of the several Deans.

INSTRUCTORS.

	1892-3	1893-4
Professors.....	51	51
Emeritus Professors.....	6	6
Adjunct Professors.....	17	15
Clinical Professors.....	6	9
Instructors.....	19	21
Tutors.....	15	18
Assistants.....	23	30
Curators.....	2	2
Lecturers.....	15	15
Director of Laboratories	1	—
Demonstrators.....	3	3
Assistant Demonstrators.....	7	7
Clinical Lecturers.....	3	6
Chiefs of Clinic.....	10	10
Clinical Assistants.....	48	61
Honorary Assistants.....	—	3
	<hr/> 226	<hr/> 257

It will be noticed that the teaching force has been importantly strengthened as compared with last year.

STUDENTS.

	Percentage.			
	1892-3	1893-4	1892-3	1893-4
Undergraduates....	296	271	18.05	15.02
Graduates.....	497	575	30.30	31.87
Non-Graduates.....	847	958	51.65	53.11
	<hr/> 1640	<hr/> 1804	<hr/> 100%	<hr/> 100%
Collegiate Course for Women (now superseded by Bar- nard College).....	<hr/> 1	<hr/> 1		
	1641	1805		

SUMMARY BY SCHOOLS.

	1892-3				1893-4			
	No. holding degree.	Without degree.	Total.	Percentage of degrees.	No. holding degree.	Without degree.	Total.	Percentage of degrees.
Law.....	103	166	269	38 %	111	137	248	45 %
Medicine.....	251	403	654	38 %	305	461	766	40 %
Mines.....	61	323	384	16 %	52	325	377	14 %
Political Science...	79	85	164	48 %	18	10	*28	64 %
Philosophy.....	63	57	120	52.5 %	65	18	83	78 %
Pure Science.....	2	3	5	40 %	23	7	30	77 %
	559	1037	1596					
Less duplicates....	62	190	252					
	497	847	1344	36.9 %	574	958	1532	37 %
Arts.....			296		1	271	272	
Coll. Course for Women			1				1	
Grand total.....			1641				1805	

* The table for 1893-94 has been made without duplicates for purposes of convenience, but it does not fairly represent, in this form, the work of the various faculties. The total number of students taught by each faculty is as follows :

Total under Faculty of Law.....	270	against	269	in	1892-93
“ “ “ “ Medicine ...	782	“	654	“	“
“ “ “ “ Mines.....	379	“	384	“	“
“ “ “ “ Political					
“ “ “ “ Science.	226	“	164	“	“
“ “ “ “ Philosophy ..	165	“	120	“	“
“ “ “ “ Pure Science	67	“	59	“	“

There has been a slight decrease in the School of Arts, due probably to causes already noted. The percentage of graduate students is larger than ever. The graduate students number 575, and they form 31.87 per cent. of the entire student body.

The following tables show the gratifying spread of our influence :

NUMBER OF COLLEGES REPRESENTED BY
GRADUATE STUDENTS.

	AMERICAN COLLEGES	FOREIGN COLLEGES
1891-92.....	87	14
1892-93.....	105	12
1893-94.....	118	18

COLLEGES REPRESENTED BY FIVE GRADUATES
OR MORE.

	1892-3	1893-4
Amherst College, Mass.....	12	15
Brown University, R. I.....	—	9
College of New Jersey (Princeton).....	29	34
College of the City of New York.....	59	79
Columbia College, N. Y.....	86	102
Cornell University, N. Y.....	5	8
Dartmouth College, N. H.....	5	2
Hamilton College, N. Y.....	6	5
Harvard College, Mass.....	39	44
Holy Cross College, Mass.....	—	6
Manhattan College, N. Y.....	6	7
Massachusetts Institute of Technology...	—	7
Ohio Wesleyan University.....	8	7
Rutgers College, N. J.....	10	12
St. Francis Xavier College, N. Y.....	11	11
Trinity College, Conn.....	5	7
University of the City of New York.....	7	7
University of Michigan.....	—	5
University of Vermont.....	5	6
Wesleyan University, Conn.....	4	6
Williams College, Mass.....	12	17
Yale University, Conn.....	51	51

The student population comes from 45 States and Territories and from 9 foreign countries.

DEGREES CONFERRED IN 1893-4.

Bachelor of Arts.....	58
“ “ “ from Barnard College.....	7
Bachelor of Laws.....	68
Master of Laws.....	1
Doctor of Medicine.....	120
Engineer of Mines	5
Civil Engineer.....	15
Electrical Engineer.....	12
Bachelor of Philosophy.....	20
Master of Arts.....	32
Doctor of Philosophy.....	17
Doctor of Laws (Honorary).....	3
Master of Arts (Honorary).....	1
Bachelor of Arts (Honorary).....	1
<hr/>	
Total.....	360

The report of the Librarian shows again very satisfactory growth on the part of the library. The additions for the year have been 15,161 bound volumes, of which 5017 were received from purchase or by exchange, and 10,144 by gift. The Library was estimated to contain at the end of the academic year 175,000 bound volumes, besides a very large number of pamphlets. The growth during the last five years has been as follows :

1889-90	14,125
1890-91	16,440
1891-92	15,408
1892-93	19,797
1893-94.....	15,161

The appropriation made by the Trustees last year for the purchase of books was kept down, under the pressure of necessity, to \$9000. This sum is hardly

more than sufficient to pay the necessary subscriptions to periodicals, and to meet the usual demands for binding. Happily, however, gifts of money for the purchase of books have been made with unexampled freedom. Mr. Avery's contributions to the increase of the Avery Architectural Library amount, for the year, to \$10,284.69. In addition to this, miscellaneous gifts for the purchase of books have been received, amounting to \$27,350, making a total of money given for the purchase of books of \$37,634.69. Most of this money, however, was received late in the year, so that the library hardly yet reflects the growth that will follow these generous contributions.

The increased use of the library is even more marked than its increase in size. This appears from the record of books loaned from the library for use at home. A loan may represent a set of books or only a single volume. It furnishes, however, the best guide we have as to the use of the library by the professors and students, apart from the reading that is done in the reading-room. The loans of books to be read at home during the last five years have been as follows :

1889-90	16,004
1890-91	22,721
1891-92	26,632
1892-93	28,184
1893-94	42,015

The increased use of the library during the year under review is very marked. It supplements and emphasizes the other evidences adduced in this report as to the good work that has been done at the university during the year.

The gifts of money for the use of the library have been as follows :

Samuel P. Avery.....	\$10,284 69
H. T. Imbrie.....	250 00
William Ziegler.....	1,000 00
Anonymous.. ..	20,000 00
A. C. Bernheim.....	100 00
W. C. Schermerhorn.....	5,000 00
Henry Adams.....	1,000 00
<hr/>	
Total.....	\$37,634 69

The gifts of Mr. Avery, in one form and another, to the Avery Architectural Library have amounted to more than \$60,000, of which the sum of \$15,000 is a permanent endowment to keep the library in repair and to insure its growth. The library numbers now more than 12,000 volumes. While more full in architecture than in any other field, as its name implies, it is in large measure an art library. The classical departments of the College find it an invaluable storehouse for the study of archæology. A catalogue of the library is now being printed at the DeVinne Press. Already four hundred pages have been printed, and it is hoped that the catalogue will be ready within a few months. This collection is already one of the most complete of its kind in the world, and it promises to be second to none. In the library building of Columbia, to be erected upon our new site, it will be the grateful duty of the College to house this collection as it deserves. In the meantime, Mr. Avery has had made by Chaplin, of Paris, a bronze tablet in memory of his son, Henry O. Avery, in commemoration of whom this library was founded. This

tablet, at the moment, is in the general reading-room ; but, at the new site, it will naturally mark the room dedicated to the use of the Avery Architectural Library.

The generous gift of \$20,000, from a gentleman wishing his name to be unknown, has been used in part to lay the foundation of what we hope will one day be a great library of jurisprudence. For the rest it will serve to strengthen importantly all the departments of the library, which were feeling severely the inability of the trustees to make an adequate appropriation for the year.

The gift of Mr. W. C. Schermerhorn was made for the purchase of books on sociology, and followed immediately upon the creation of the professorship of sociology by the trustees. The literature of this subject is very large in all the modern languages, and even this generous sum will only lay the foundations of an adequate library. The importance of the subject, however, is so manifest in these times that it may reasonably be hoped the library will grow according to the needs of the department.

The gift of \$1000 from Mr. Henry Adams was especially gracious. Through the generosity of Mr. Joseph F. Loubat the College last year was authorized to give certain prizes, to be known as the Loubat Prizes, for the best works published within a certain interval upon the history, geography, archæology, philology or numismatics of North America. The first prize of \$1000 was awarded to Mr. Henry Adams for his History of the United States of America during the Administrations of Jefferson and Madison. The second prize of \$400 was awarded to Mr. A. F. Ban-

delier for his Report of Investigations among the Indians of the Southwestern States. Mr. Adams has generously turned over to the library, for the purchase of books upon American history, the amount of the prize thus awarded to him.

In addition to the gifts for library purposes, the Treasurer has received the following sums :

From Alumni Association of the College of Physicians and Surgeons, for fellowship stipends.....	\$1,500 00
From Samuel D. Babcock, for an annual fellowship	500 00
From Seth Low for the Henry Drisler Classical Fund.....	10,000 00
From the estate of the late President Barnard (final payment).....	1,002 52
From the estate of the late Mrs. President Barnard (final payment).....	15,889 41
From miscellaneous givers, for miscellaneous objects.....	4,233 34
Total.....	<u>\$33,125 27</u>

FOR THE NEW SITE.

From the estate of the late Hamilton Fish..	\$50,000 00
“ Cornelius Vanderbilt.....	35,000 00
“ J. Pierpont Morgan.....	33,333 33
“ D. Willis James.....	16,666 67
“ R. Fulton Cutting.....	10,000 00
“ Estate of A. A. Low.....	5,000 00
“ Seth Low.....	1,000 00
Total	<u>\$151,000 00</u>

It can hardly escape the most casual reader of this list of gifts to the College, that it includes a bequest from the late President Barnard, one from his Wife, and one from the late Hamilton Fish. President

Barnard made the College the residuary legatee of his entire estate after the death of his wife; and his widow in her turn also made the College her residuary legatee. Dr. Barnard was President of Columbia College for twenty-five years. Mr. Fish served as trustee of the College for more than fifty years. Such gifts as these, from persons so related to Columbia, ought to put an end forever to the popular impression that the College has no further need of money. It is true that the endowment of the College is large; but it is also true that it is using every penny of it in educational work of the highest order. A university that does not grow cannot live. I esteem it a part of the good fortune of the city, and of the College as well, that the time has come when Columbia must be a constant and importunate beggar. I wholly misconceive the temper of the city if the old College has to plead in vain.

I ask attention also to the gift of Mr. Babcock of \$500 for an annual fellowship. Many people may be willing to give a fellowship, or a scholarship, year by year, who may not care to provide an endowment adequate to produce the annual stipend attaching thereto. A fellowship is ordinarily \$500 in amount, though it may be larger, and it is available for a graduate student. A scholarship is intended to pay the tuition fee of an undergraduate student. It amounts to \$150 in the School of Arts and \$200 in the School of Mines. Such gifts will be welcome.

During the year, the clerk of the trustees, in examining the old records of the College, discovered that two legacies of \$1000 each, received many years ago, had apparently been merged in the general fund.

One of these legacies came from Sampson Simson, of the Class of 1800, and one from John McKeon, of the Class of 1825. The trustees have ordered that separate funds, to bear the name of the donors, be created, the income of which shall be used for the purchase of books for the law library, both of these gentlemen having been lawyers.

On the first of July the College completed the payment of \$1,000,000 for the new site. To complete this payment it was necessary for the College to borrow \$200,000; but this debt will be liquidated shortly by legacies due the College or from other funds at its command, without interfering with its annual revenues. The College is to take possession of the new site October 1, 1894, at which time it is to give a purchase-money mortgage of \$1,000,000 in final settlement. If the present site of the College sells promptly for as much as the trustees think it is worth, the College ought to receive from it enough to pay off this mortgage and to meet the expenses of moving and fitting up the new grounds, in temporary fashion, for our occupancy. There will be many expenses, such as fencing, grading, and the like, which the College itself must bear. It is my earnest hope that the buildings to be erected there will come to the College, without exception, by gift. It was the good fortune of the Committee on Buildings and Grounds to submit, in May last, a scheme for the development of the new site which commanded the unanimous approval of the trustees. The summer has been largely given to the development of plans for the buildings immediately to be erected. While it is hoped that the College can utilize for a time some of the build-

ings already on the new grounds, some new buildings are immediately necessary. We must have a fireproof library into which to move our books ; and we must have a fireproof building in which to deposit our extensive and valuable scientific collections. These two buildings represent our minimum needs. In addition to these we ought to have at the outset a gymnasium, a dining hall and a chapel. Even with these buildings we should have only a part of those which we could use advantageously from the beginning. We ought to have a building for the School of Arts, another for engineering, another for architecture, another for chemistry and another for physics. Law and some other subjects will be accommodated temporarily in the library building. We ought to have a hall which should be the centre of the social life of the students, in which the literary societies could hold their meetings, the musical clubs, and all the many societies that make so large a part of student life in an American university. Then there should be an academic theatre, so that the commencements may be held upon the grounds of the university itself. Naturally all these things will not come at once. I have tried to indicate the order in which they seem to me to be needed. For the sake of clearness I append a list indicating the probable cost of each building, the figure in each case being only an approximation.

We need, then, as soon as we can get them, the following structures :

	ESTIMATED COST.
Library.....	\$ 750,000
Natural Science Building.....	300,000

	ESTIMATED COST.
Gymnasium	\$ 200,000
Dining Hall.	150,000
Chapel	200,000
School of Arts.....	200,000
Engineering.....	300,000
Architecture.....	200,000
Chemistry	200,000
Physics	200,000
Society Hall	250,000
Academic Theatre	150,000

I hope that some of those under whose eye this report may fall will feel both able and glad to contribute one or another of these buildings to New York's historic college. By general consent the new site is unsurpassed in location by that of any university in the world. It is near the Grant monument and the new cathedral of St. John the Divine. Any one placing a building upon this site, in such a location, may be confident of a memorial at once enduring and useful, and one which will be before the eyes of the people of the United States almost more than any college building in the land. Every stranger that visits New York will certainly visit these heights to see the monumental buildings which will be clustered there; and the people of New York, in showing them to their friends, will become familiar with them, and their affection will dwell upon them as among the most important buildings that minister to their civic pride.

Respectfully submitted,

SETH LOW,

President.

APPENDIX.

THE FOLLOWING BECOME EMERITUS PROFESSORS JULY 1, 1894.

HENRY DRISLER, LL.D, Emeritus Professor of the Greek Language and Literature.

JOHN D. QUACKENBOS, A.M., M.D., Emeritus Professor of Rhetoric.

DEATHS DURING ACADEMIC YEAR OF 1893-94.

Rev. THOMAS MORONG, Ph.D., Curator of the Herbarium.

VACANCIES OCCURRING DURING ACADEMIC YEAR OF 1893-94.

BERNARD F. O'CONNOR, Ph.D.,	Resigned.
GUSTAV J. VOLCKENING, Jr., Met.E., E.M.,	"
ARTHUR WILLEY,	Term expired.
DELANCEY W. WARD, Ph.B.,	" "
FREDERIC T. COOPER, A.M.,	" "
STEPHEN F. WESTON, A.M.,	" "
CLARENCE W. VAIL, A.B.,	" "
FREDERICK W. WHITRIDGE, A.M., LL.B.,	" "
ROBERT THORNE, A.M.,	" "
ROYAL W. WHITMAN, M.D.,	" "

PROMOTIONS, DATING FROM JULY 1, 1894.

E. B. WILSON, Ph.D.,	Professor of Invertebrate Zoölogy.
FRANKLIN H. GIDDINGS, A.M.,	Professor of Sociology.
HENRY P. STARBUCK, LL.B.,	Professor of Law.
GEORGE F. CANFIELD, LL.B.,	Professor of Law.
THOMAS S. FISKE, A.M., Ph.D.,	Adjunct Professor of Mathematics.
HAROLD JACOBY, A.B.,	Adjunct Professor of Astronomy.
BENJAMIN D. WOODWARD, A.M.,	Instructor in Romance Languages and
Ph.D.,	Literatures.
CHARLES S. BALDWIN, A.M.,	Instructor in Rhetoric.

ANDREW E. FOYÉ, C.E.,	Instructor in Civil Engineering.
JAMES EWING, M.D.,	Tutor in Normal Histology.
E. H. MILLER, Ph.B.,	Tutor in Analytical Chemistry and
PARKER C. MCILHINEY, Ph.B.,	Assaying.
A.M., Ph.D.,	Assistant in Metallurgy.
EDWIN M. KITCHEL, M.D.,	Second Assistant in Normal Histology.
PEARCE BAILEY, M.D.,	Third Assistant in Pathology.
GILBERT VAN INGEN,	Curator of the Geological Collections.
A. C. BERNHEIM, LL.B., Ph.D.,	Lecturer on the Political History of the
	State and City of New York.
CHARLES P. WARREN, A.M.,	Lecturer in Architecture.
CHARLES T. TERRY, A.B., LL.B.,	Lecturer on Procedure in Equity and
	under the Code.

APPOINTMENTS, DATING FROM JULY 1, 1894.

*ANDREW J. MCCOSH, M.D.,	Clinical Lecturer upon Surgery.
*JOHN WINTERS BRANNAN, M.D.,	Clinical Lecturer upon Contagious
	Diseases.
VIRGIL P. GIBNEY, M.D.,	Clinical Lecturer in Orthopedic Sur-
	gery.
*ROYAL W. WHITMAN, M.D.,	Instructor in Orthopedic Surgery.
GARY N. CALKINS, B.S.,	Tutor in Biology.
W. T. BREWSTERS, A.M.,	Tutor in Rhetoric.
†FRANCIS A. PROVOT, C.E.,	Assistant in Drawing.
‡HENRY POWER, M.D.,	Second Assistant in Normal Histology.
*CLARENCE W. VAIL, A.B.,	Assistant in Rhetoric.
H. J. BURCHELL, Jr., A.M.,	Assistant in Latin.
MARSTON T. BOGERT, A.B.,	Assistant in Chemistry.
ARTHUR M. DAY, A.M.,	Assistant in Political Economy and
	Social Science.
NORMAN WILDE, Ph.D.,	Assistant in Philosophy.
T. H. KEARNEY, Jr.,	Curator of the Herbarium.

* Appointment dates from Feb. 5, 1894.

† Appointment dates from Nov. 1, 1893.

‡ Appointment dates from Dec. 4, 1893.

LECTURES.

The following lectures were delivered during the academic year of 1893-94:

In Room 28, Hamilton Hall—thirty lectures by Dr. G. W. Hill, on successive Saturday mornings, on

CELESTIAL MECHANICS.

The character of the course is indicated in the following divisions:

- I. General Equations of Dynamics.
- II. Derivation of Gravitation from the Phenomena.
- III. Differential Equations of a System under the action of Gravitation.
- IV. The Theory of Elliptic Motion.
- V. Perturbations as Variations of Co-ordinates.
- VI. Perturbations as Variations of the Elliptic Elements.
- VII. Hansen's Method.
- VIII. Delaunay's Method.
- IX. Gylden's Method.
- X. Development of the Perturbative Function.
- XI. Secular Perturbations in Particular.
- XII. The Lunar Theory in Particular.
- XIII. The Theory of Satellites.
- XIV. General Considerations on the Stability of Motion of Planetary Systems.

In Room 11, Library Building—six lectures by the Hon. Theodore Roosevelt, on

THE WESTERN GROWTH OF THE UNITED STATES DURING THE REVOLUTIONARY WAR.

- | | |
|-----------------------|--|
| Saturday, October 21. | The Backwoodsmen of the Western Border and their Foes. |
| “ “ 28. | The West in the Revolution. |
| “ November 4. | The Foundation of the Trans-Alleghany Commonwealths. |
| “ “ 11. | The Indian Wars. |
| “ “ 18. | The Conquest of the Illinois. |
| “ “ 25. | The West at the Close of the Revolution. |

In Room 11, Library Building—a lecture by Mr. William Clarke, December 7th, on

THE GOVERNMENT OF LONDON.

In Room 11, Library Building—a lecture by Mr. William Hamilton Gibson, January 17th, on

CROSS-FERTILIZATION OF FLOWERS BY INSECTS.

In Room 11, Library Building—three lectures by Professor Edward B. Poulton, F.R.S., on

MEANING AND USE OF THE COLORS OF ANIMALS.

Wednesday, January 24. Colors for Concealment.

“ “ 31. Colors for Warning and Signalling.

Thursday, February 8. Colors for Mimicry.

Four lectures by Prof. Henry Fairfield Osborn, on

PROBLEMS OF MODERN EVOLUTION.

Friday, February 9. Are Acquired Characters Inherited? Lamarck, Darwin, Weismann.

“ “ 16. The Laws of Heredity. Galton, Weismann.

“ “ 23. The Evolution of Man at the Present Time.

“ March 2. The Unknown Factor in Evolution.

Three lectures by Dr. Livingston Farrand, on

HYPNOTISM.

Friday, March 9. History of Hypnotism. General Considerations.

“ “ 16. Symptoms of the Hypnotic State, Physiological and Psychological.

Thursday, “ 22. The same continued. Explanatory Theories of the State.

At the American Museum of Natural History—four lectures by Henry S. Munroe, E.M., Ph.D., on

MINING.

- December 2. Prospecting.
- “ 9. Development of Mineral Properties.
- “ 16. Coal Mining.
- “ 23. Metal Mining.

At the American Museum of Natural History—four lectures by William Hallock, Ph.D., on

LIGHT.

- January 6. Propagation of Light. The Camera.
- “ 12. The Eye as an Optical Instrument.
- “ 20. Microscopes.
- “ 27. Telescopes.

At the American Museum of Natural History—four lectures by Mr. William Hamilton Gibson.

- February 3. The Ichneumon Wasp and its Victims.
- “ 10. Insects as Botanists : Remarkable Instinct of Insects by which the food plants for their young are selected in distinct botanical orders.
- “ 17. Insects as the Counterparts of Flowers : Why many Flowers depend upon Insects in their Fertilization and Perpetuity.
- “ 24. A few common Flowers and their remarkable Mechanisms Insuring Cross-Fertilization by Insects.

At the American Museum of Natural History—two lectures by Charles F. Chandler, Ph.D., M.D., LL.D.,

- March 3. Aluminium.
- “ 10. Electric Lighting.

At the American Museum of Natural History—two lectures by Frederick R. Hutton,

- March 17. The Mechanical Engineering of an Ocean Greyhound.
- “ 24. The Growth of the Locomotive Engine.

At the Metropolitan Museum of Art—four lectures by
Rev. William Hayes Ward, on

ORIENTAL SEALS AND GLYPTIC ART.

- December 2. Origin in Primitive Babylonia.
 “ 9. Mythological Art of the Early and Middle
 Empire of Babylonia.
 “ 16. Transfer of the Art to Assyria.
 “ 23. Derivative Art of Persia, Syria, Asia Minor,
 and Phœnicia.

At the Metropolitan Museum of Art—four lectures by J.
C. Van Dyke, L.H.D., on

MODERN PAINTING HISTORICALLY AND CRITICALLY CON-
SIDERED.

- January 6. Portrait Painting.
 “ 13. Landscape Painting—Classic and Romantic.
 “ 20. Landscape Painting—Realistic and Impres-
 sionistic.
 “ 27. Animal Painting.

At the Metropolitan Museum of Art—four lectures by A.
C. Merriam, Ph.D., on

GREEK ART.

- February 3. The Works of Polyclitus and the Sculptures
 Discovered by the American School at
 the Argive Heræum.
 “ 10. Nikè or Victory in Greek Art.
 “ 17. The Pictorial in Greek Sculpture of the Fifth
 Century B.C.
 “ 24. Attic Sepulchral Art.

At the Metropolitan Museum of Art—two lectures by
Grenville T. Snelling, B.S., on

THE CATHEDRAL OF NOTRE DAME.

- March 3. The Lay Builders.
 “ 10. Gothic Styles.

At the Metropolitan Museum of Art—two lectures by Allan Marquand, Ph.D., L.H.D.,

March 17. Ghiberti and the Baptistry Gates.

“ 24. Donatello.

In the Great Hall, Cooper Union—four lectures by Mr. Hamilton W. Mabie,

November 28. Literature and Life.

December 5. Books and Business.

“ 12. Samuel Johnson and his Times.

“ 19. Literature as a Personal Resource.

In the Great Hall, Cooper Union—four lectures by Professor A. D. F. Hamlin, on

THE ARCHITECTURE OF THE COLUMBIAN EXPOSITION.

January 9. The General Treatment of the Buildings and Grounds.

“ 16. The Court of Honor. Detailed Criticism of its Main Buildings.

“ 23. The Northern Region, with Notices of some of the State and National Buildings.

“ 30. Architectural Embellishments and Decorative Features of the Exposition.

In the Great Hall, Cooper Union—four lectures by E. R. L. Gould, Ph.D., on

FOUR LIVE SOCIAL PROBLEMS OF CITIES.

February 6. The Liquor Question.

“ 13. Public Recreation.

“ 20. The Housing of the Poor.

“ 27. The Care of the Unemployed.

In the Great Hall, Cooper Union—four lectures by Francis B. Crocker, E.M., on

ELECTRICITY AS A FACTOR IN MODERN LIFE.

March 6. The Dynamo and Electric Lighting.

“ 13. The Electric Motor and Transmission of Power.

“ 20. The Electric Railway.

“ 27. The Telegraph and the Telephone.

TABLE OF DEGREES HELD BY GRADUATE STUDENTS.

Number holding degree of A.B.....	361
“ “ “ “ B.D.....	2
“ “ “ “ B.L.....	2
“ “ “ “ B.S.	92
“ “ “ “ B.S.A.	3
“ “ “ “ C.E.....	7
“ “ “ “ E.E.....	1
“ “ “ “ LL.B.	11
“ “ “ “ M.B.	1
“ “ “ “ M.E.....	3
“ “ “ “ Mech.E.....	2
“ “ “ “ Ph.B.	4
“ “ “ “ Ph.G.....	21
“ “ Testimonium Maturitatis....	4
“ “ Zeugniss der Reife.....	1
<hr/>	
Number holding first degree.....	535
Number holding degree of A.M.....	53
“ “ “ “ M.D.	32
“ “ “ “ M.S.....	4
“ “ “ “ Ph.D.....	4
<hr/>	
	93
	<hr/>
	628
Holding more than one degree.....	53
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Total number holding degrees.....	575

PARENTAGE OF DEGREES.

Agricultural and Mechanical College of Texas....	3
Amherst College, Mass.	15
Arkansas Industrial University.....	1
Augustana College, Ill.....	1
Baylor University, Texas.....	1
Bellevue Hospital Medical College, N. Y.....	1
Beloit College, Wis.....	3
Blackburn University, Ill.....	2

Bowdoin College, Me.....	4
Brooklyn Polytechnic Institute, N. Y.....	2
Brown University, R. I.....	9
Centre College, Ky.....	2
Chicago College of Pharmacy, Ill.....	1
Christian Brothers College, Tenn.....	1
Colgate University, N. Y.....	2
College of New Jersey (Princeton)	34
College of the City of New York.....	79
Columbia College, N. Y.....	102
Cornell University, N. Y.....	8
Dalhousie College.....	1
Dartmouth Medical College, N. H.	1
Dartmouth College, N. H.....	2
Davison College, N. C.....	1
Denison College, O.....	1
Detroit College, Mich.....	1
Doane College, Neb.....	1
Franklin and Marshall College, Pa.....	2
Gammon Theological Seminary, Ga.....	1
Georgetown College, Ky.....	2
Georgetown University, D.C.....	2
Hamilton College, N. Y.....	5
Harvard College, Mass	44
Hiram College, O.....	1
Hobart College, N. Y.....	2
Holy Cross College, Mass.....	6
Illinois College.....	1
Indiana Normal School.....	1
Iowa College	1
Iowa State University.....	1
Jefferson Medical College, Pa.....	3
Johns Hopkins University, Md.....	3
Kansas State University.....	1
Kenyon College, O.....	2
Law School of Cincinnati College, O.....	1
Leland Stanford Junior University, Cal.....	3
Lincoln University, Pa.....	1
Manhattan College, N. Y.....	7
Marietta College, O.....	1

Marquette College, Wis.....	1
Massachusetts Institute of Technology.....	7
Medical College of Virginia.....	1
Miami Medical College, O.....	1
Michigan Agricultural College.....	1
Missouri Medical College.....	1
New York College of Pharmacy.....	16
Notre Dame University, Ind.....	1
Oberlin College, O.....	2
Ogden College, Ky.....	1
Ohio Normal University.....	1
Ohio State University.....	3
Ohio Wesleyan University.....	7
Olivet College, Mich.....	1
Park College, Mo.....	1
Pennsylvania College.....	1
Pennsylvania Military Academy.....	1
Pennsylvania State College.....	1
Philadelphia College of Pharmacy, Pa.....	3
Rutgers College, N. J.....	12
Santa Clara College, Cal.....	1
Seton Hall College, N. J.....	1
Shurtleff College, Ill.....	1
South Carolina Medical College.....	1
Spring Hill College, Ala.....	1
State University of North Dakota.....	1
Stevens Institute of Technology, N. J.....	3
St. Francis Xavier College, N. Y.....	11
St. John's College, Md.....	1
St. John's College, N. Y.....	2
St. Peter's College, N. J.....	1
St. Stephen's College, N. Y.....	1
Swarthmore College, Pa.....	2
Syracuse University, N. Y.....	3
Trinity College, Conn.....	7
Tulane University, La.....	1
Union College, N. Y.....	2
Union Theological Seminary, N. Y.....	1
United States Military Academy, N. Y.....	1
United States Naval Academy, Md.....	1

University of Alabama.....	3
University of Boston, Mass.....	2
University of Buffalo, N. Y.....	1
University of California.....	2
University of Cincinnati, O.....	1
University of the City of New York.....	7
University of Indiana.....	2
University of Kansas....	1
University of Maryland.....	1
University of Michigan.....	5
University of Minnesota.....	1
University of North Carolina.....	2
University of Oregon.....	1
University of the Pacific, Cal.....	1
University of Pennsylvania.....	1
University of Rochester, N. Y.....	2
University of South Carolina.....	3
University of Texas.....	4
University of Vermont.....	6
University of Virginia.....	3
University of Wisconsin.....	1
University of Wooster, O.....	1
Washington and Jefferson College, Va.....	2
Washington and Lee University, Va.....	1
Wesleyan University, Conn.....	6
Westminster College, Pa.....	1
Willamette Medical College, Ore.....	1
Williams College, Mass.....	17
Yale University, Conn.....	51

607

Foreign Institutions.

Bishop's College, Canada.....	1
College of the State of Vera Cruz, Mexico.....	1
Gymnasium, Bohemia.....	2
Gymnasium, Mitau, Russia.....	1
Gymnasium at Reval, Russia.....	1
Imperial University of St. Petersburg, Russia....	1
Institute Provincial de Guipuscoa, Vergara, Spain..	1
Medical Academy, St. Petersburg, Russia.....	1

Ottawa University, Canada.....	1
Oxford University, England.....	1
Provincial Institute of First Degrees, Porto Rico..	1
Royal College of Budapesth.....	1
St. Joseph's College, Canada.....	1
University of Costa Rica.....	1
University of Gottingen, Germany.....	1
University of Havana.....	2
University of Toronto, Canada.....	2
Urmi College, Persia.....	1
	<hr/>
	21
Total.....	<hr/> 628
Deduct duplications.....	53
	<hr/> 575

RESIDENCES OF STUDENTS.

	Arts.	Law.	Medicine.	Mines.	Political Science.	Philosophy.	Pure Science.	Coll. Course for Women.	Total.
New York City.....	151	125	304	189	5	50	10	1	835
Brooklyn.....	35	23	56	48	3	4	1		170
Alabama.....	1	1	5						7
Alaska.....			1						1
Arkansas.....			1						1
California.....		2	5	2	1	1			11
Colorado.....			1						1
Connecticut.....	1		22	5	1	1			30
Delaware.....							1		1
Dist. of Columbia...			2	1					3
Florida.....			1						1
Georgia.....			2	1					3
Idaho.....				1					1
Illinois.....	1	3	6	1	1	3	1		16
Indiana.....	1	1	5		1				8
Iowa.....		1	3						4
Kansas.....		2	2						4
Kentucky.....		1	8	1		1			11
Louisiana.....				1					1
Maine.....	1	1	6		1		1		10
Maryland.....		4	1	3					8
Massachusetts.....		3	26	2	4	2			37
Michigan.....		3	1	2	1				7
Minnesota.....		2	4	2					8
Missouri.....	1	1	3	1					6
Montana.....		1							1
Nebraska.....			3			1			4
New Hampshire.....		3	3						6
New Jersey.....	28	21	102	50	3	4	4		212
New Mexico.....					1				1
New York State.....	46	31	102	47	2	9	4		241
North Carolina.....			2						2
North Dakota.....			2						2
Ohio.....	1	7	9	7		2	2		28
Oregon.....		1	5	2					8
Pennsylvania.....	1	4	15	4		1	2		27
Rhode Island.....			8			1			9
South Carolina.....		1	2						3
Tennessee.....			5				1		6
Texas.....	1	1	13		1				16
Utah.....		2	1						3
Vermont.....	1	1	5				1		8
Virginia.....			4			1			5
Washington.....			1						1
West Virginia.....			4	1					5
Wisconsin.....	1	2	4	1		2			10
	271	248	755	372	25	83	28	1	1783

FOREIGN COUNTRIES.

	Arts.	Law.	Medicine.	Mines.	Political Science.	Philosophy.	Pure Science.	Coll. Course for Women.	Total.
Brought forward...	271	248	755	372	25	83	28	1	1783
Canada.....			5	1	2		2		10
Colombia.....			1						1
Costa Rica.....			2						2
Cuba.....	1		1	2					4
France.....			1						1
Japan.....					1				1
Mexico.....				1					1
Nicaragua.....			1						1
South America.....				1					1
	272	248	766	377	28	83	30	1	1805

SCHOOL OF ARTS

REPORT OF THE DEAN

FOR THE ACADEMIC YEAR ENDING JUNE 30, 1894.

*To the President of Columbia College
in the City of New York :*

SIR :

I respectfully submit herewith the report on the work and condition of the School of Arts of Columbia College for the academic year 1893-4.

The regular work of the School of Arts in all the subjects of its several classes began as usual on the first Monday of October, 1893.

The attendance of the members of the classes, and their performance of the duties assigned them in the various departments, whether required or elective, were in general satisfactory. The behavior of the undergraduate classes during the whole College year was unusually quiet and orderly. This result justifies the plan adopted by the President of taking into consideration the advice and assistance of the presidents of the classes in matters of order.

The instruction of the Junior, Sophomore, and Freshman classes has been given by the professors and other officers of the School of Arts, while that of the Senior class, which is wholly elective, has been under the direction of and conducted by the University Faculties of Law, Medicine, Mines, Political Science, Philosophy, and Pure Science.

The number of students, who matriculated at the begin-

ning of the academic year 1893-4 was 276; six were added in the course of the year, two Sophomores, one Freshman, and three Specials, making the number 282, distributed in the several classes as follows :

Seniors	65	with specials added or {	Seniors	70
Juniors	57		Juniors	64
Sophomores	60		Sophomores	68
Freshmen	56		Freshmen	79
Specials	43		Course for Women	1
Course for Women	1			<hr/> 282

In the second column the Special students are assigned to the classes, with which they pursue the greatest number of studies.

The ages of the students at the beginning of the academic year in the several classes were :

Class.	No. in Class.	Average Age.	Oldest.	Youngest.
Senior	65	20 $\frac{1}{2}$	25	18
Junior	57	19 $\frac{3}{4}$	27	16
Sophomore	60	18 $\frac{1}{2}$	24	15
Freshman	56	17 $\frac{1}{2}$	22	15
Specials	43	19 $\frac{1}{2}$	42	16

Under the regulations of the Faculty of the School of Arts students admitted to the Freshman class with conditions at the beginning of the academic year shall be held under probation till the end of the first term; they shall then be dropped from the roll of the College if they have not made satisfactory progress in all their studies. Of the entering class twenty-seven were admitted with conditions. Of these eight had only one condition each.

At the close of the first term all except one were reported as having made satisfactory progress in the various departments. The one who had failed to show any improvement was dropped from the roll of the class.

In the course of the year one Senior, one Junior, three Sophomores, and one Freshman were withdrawn; and one Senior, one Freshman, and two Special students were dropped.

Of the students who entered College in 1893 twenty-two were on certificates from other colleges.

Fifty-nine members of the Senior class having completed all the studies of the courses elected by them, and having passed satisfactorily all the required examinations, having presented also the theses required for graduation, received the degree of A.B. at the Commencement held June 13, 1894.

Seven members of the class having failed to satisfy all the requirements for graduation were excluded.

The studies of the Freshman class occupied fifteen hours a week, and were all obligatory, except that a Freshman might choose French or German, but was not required to take both. The studies of the Sophomore class demanded sixteen hours a week, and were all obligatory; a student might, however, substitute Chemistry, three hours a week, for any language, ancient or modern, except English.

The distribution of subjects and hours in the Freshman year was:

	Hours per week.		Hours per week.
Greek	3	Mathematics...	3
Latin.....	3	French or Ger-	
English.....	3	man	3

In the Sophomore year:

	Hours per week.		Hours per week.
Greek	3	Mathematics...	2
Latin	3	History.....	2
English.....	3	French or Ger-	
		man	3

Chemistry (in place of Greek, Latin, French or German), 3 hours.

Spanish and Italian might be chosen by any student of the Freshman or Sophomore class, who had passed satisfactory examinations in the French and German of the first and second years.

For the studies of the Junior class fifteen hours per week were allotted; of these four were for required studies, and eleven for elective courses.

The required studies with number of hours were:

	Hours per week.
History and Political Economy.....	2
Logic and Psychology.....	2

The elective courses open to the Juniors with the number of hours assigned to each course were :

	Hours per week.		Hours per week.
Astronomy	2	Latin I. and III. Juvenal and Cicero de Officiis	2
Biology Elementary, with laboratory work.....	3	Latin II. and IV. Terence, Andria and Phormio, and Lucretius de Rerum Natura	2
{ Botany, I., Elementary, with laboratory work.	3	Mathematics I. Analytical Geometry....	3
{ Botany, II., with laboratory work.....	2	Mathematics II. Determinants and Modern Geometry	2
{ Chemistry I. Inorganic with laboratory work.	3	Mechanics, with experiments.....	2
{ Chemistry II. Applied Chemistry.....	3	{ Physics I. Elementary, with laboratory work	5
Geology General.....	2	{ Physics II. Elementary — Minor Course — with laboratory work.	3
{ German I. Goethe's Faust	2	Rhetoric Lectures and Essays	2
{ German II. History of German Literature..	2	Romance Languages :	
{ German III. Select Historical Prose....	2	{ French I. French Rhetoric	3
{ German IV. History of German Language..	2	{ French II. French Literature in the 17th Century	3
{ German VII. Middle High German.....	2	{ Italian I. Elementary.	3
{ English I. Laws of Prose Composition..	2	{ Italian II. Prose and Poetry of the 16th Century	3
{ English II. Shakspeare, Language, Versification, etc.....	2	{ Italian III. Prose and Poetry of the 14th Century	3
{ English X. Spenser and the Elizabethan Poets	1	{ Spanish I. Elementary.	3
{ English XI. Milton and the Caroline Poets.....	1	{ Spanish II. Modern Prose and Poetry... ..	3
{ English XII. 19th Century Literature.....	2	{ Spanish III. Literature of the Golden Age..	3
{ Greek I. Sophocles and Thucydides.....	3	Semitic Languages :	
{ Greek II. Æschylus and Isocrates.	2	Hebrew I. Biblical Hebrew, Elementary Course	2
{ Greek III. Lectures on the Greek Drama...	1		
{ Greek IX. Lectures on Greek Art.....	1		
Language, General Introduction.....	3		

The election in modern languages in the Sophomore and Freshman classes was :

	Number in Class.		
	Sophomore.	Freshman.	Total.
	60	56	116
French	34	34	68
German	24	20	44
Italian	2	2
Chemistry	2	..	2
(in place of French and German.)			

NOTE.—See also under subjects elected by Special students, p. 56.

In the Sophomore class the election of studies, omitting Special Students, was :

	Number in Class.....		60
Greek	36	French.....	34
Latin.....	54	German	24
Chemistry.....			32

with the following substitutions :

Chemistry in place of Greek.....	24
Chemistry “ “ “ Latin	6
Chemistry “ “ “ German	1
Chemistry “ “ “ French.....	1

Of the forty-two elective courses offered to the Junior class, occupying eleven hours a week, the following table shows the number of students electing the several courses :

STUDIES ELECTED BY JUNIORS.

Architecture (not open)....	1	Latin.....	18	
Astronomy	9	Mathematics	6	
Biology	3	Mechanics.....	3	
Botany.....	8	Physics.....	30	
Chemistry	31	Philosophy (not open)....	1	
English.....	44	Romance Languages :		
Geology.....	10	{	French.....	9
German	24		Italian.....	3
Greek.....	23		Spanish	9
Language.....	7			

SENIOR CLASS.

The studies of the Senior class are all elective, and may be taken at the choice of the student in the courses that are open to them in the University Departments of Law, Medicine, Mines, Political Science, Philosophy, and Pure Science. In the department of Law the members of the Senior class were allowed to take the entire first-year course, thirteen hours a week, in part preparation for the degree of A.B., to which they were required to add two hours from other University courses open to them. In the department of Medicine the first-year course occupied the whole fifteen hours, required for the A.B. degree.

The election of subjects under the several University Faculties was as follows :

University Department of Law	20
“ “ “ Medicine	9
“ “ “ Mines	4
“ “ “ Political Science	19
“ “ “ Philosophy	45
“ “ “ Pure Science	25

Of those whose studies were entirely in one department of the University the number was :

In Medicine	6
In Philosophy	6
In Pure Science	1

Of those whose studies were in two University departments the number was :

In Law and Political Science	8
“ Law and Mines	1
“ Law and Philosophy	11
“ Mines and Pure Science	2
“ Philosophy and Political Science	8
“ Philosophy and Pure Science	14
“ Medicine and Pure Science	1

Of those whose studies were pursued in three or more University departments the number was :

In Philosophy, Political Science, and Pure Science ..	4
“ Philosophy, Medicine, and Pure Science	2
“ Philosophy, Mines, and Pure Science	1

Of the twenty students who elected the first-year Law course thirteen intended to continue the study of law for a profession ; six pursued the first-year course as part of a liberal education, and one had left the matter undecided.

The six, who elected the first-year course in the School of Medicine, intended to return to the College of Physicians and Surgeons, and to pursue the study of medicine for a profession.

The particular students under the several University Faculties, with the number of students under each, are as follows :

Under the Faculty of Law :

The full first-year course of thirteen hours..... 20

Under the Faculty of Medicine :

The full first-year course equivalent to fifteen hours a week..... 6
 Physiology 2
 Anatomy 1

Under the Faculty of Mines :

Architecture..... 3
 Mineralogy..... 1

Under the Faculty of Political Science :

Constitutional History of Europe and the United States..... 10
 Constitutional History of England..... 7
 History of Political Theories 3
 Political Economy..... 16

Under the Faculty of Philosophy :

English.....	35		Oriental Languages :
German	11	{	Sanskrit..... 1
Greek.....	11	{	Semitic..... 4
Language	3		Philosophy..... 24
Latin.....	5		Pedagogy..... 3
Literature	22		Romance Languages :
		{	French..... 5
		{	Spanish..... 1

Subjects under Faculty of Philosophy in detail, with numbers of Seniors electing them, including both regular and special students, and the several subjects in each department :

English I, Laws of Prose Composition in English	7	Language, General Introduction	3
English II, Shakspeare, Language, Versification, etc.....	7	Latin I and III, Juvenal and Cicero de Officiis..	1
English III, Chaucer, Language, Versification, etc.....	6	Latin IV, Lucretius.....	4
English V, The Poetry of Tennyson, Browning, and Matthew Arnold..	9	Latin VI, Roman History Tacitus, Suetonius and Velleius Paterculus....	3
English VI, Anglo-Saxon and English Historical Grammar.....	3	Latin VII, Plautus.....	4
English VII and VIII, Anglo-Saxon Poetry and Early English....	6	Latin XII, Horace, rapid reading of all the poems	5
English X and XI, Spenser and Milton...	2	Literature I, History and Theory of Criticism...	14
English XII, 19th Century Literature.....	4	Literature II, History of Modern Fiction	14
English XIII, American Literature	21	Literature III, Epochs of the Drama	5
English XIV, English Versification	1	Oriental Languages :	
Germanic Languages :		Sanskrit I, Elementary ..	1
German I, Goethe's Faust	6	Semitic I, Biblical Hebrew	3
German II, History of German Literature....	1	Semitic V, Semitic Epigraphy.....	1
German III, Selected Historical Prose	3	Semitic IX, Arabic.....	1
German IV, History of the German language..	1	Pedagogy II, Principles of Teaching	3
German X, Danish and Norwegian literature..	1	Philosophy II, Ethics....	18
Greek II, Æschylus and Isocrates	2	Philosophy III, General History of Philosophy.	20
Greek III, Lectures on the Greek Drama.....	2	Philosophy V, Philosophy of Kant and his successors	1
Greek IV, Pindar and Demosthenes	2	Philosophy XIII, Experimental Psychology....	3
Greek V, Lectures on Elegiac, Iambic and Melic Poets.....	2	Romance Languages :	
Greek VI, New Testament, Epistles	3	French II, French Literature in the 17th Century.....	1
Greek VII, New Testament, Gospels and Acts	7	French III, French Literature in the 18th Century.....	3
Greek IX, Greek Art....	6	French IV, Victor Hugo.	1
Greek X, Topography, Mythology and Monuments of Ancient Greece	1	Spanish II, Composition, Modern prose and poetry.....	2

Under the Faculty of Pure Science :

Astronomy.....	3	Geology.....	2
Biology.....	3	Mathematics.....	5
Botany.....	8	Physics.....	20
Chemistry.....	9	Mechanics.....	1

Subjects under Faculty of Pure Science in detail, including the several subjects in each department.

{	Astronomy I, General....	1	{	Chemistry I, Inorganic, with laboratory work..	4	
	Astronomy II, Practical Astronomy and Naviga- tion.....	2		Chemistry II, Applied Chemistry	3	
	Biology II, Elementary with laboratory work..	1		Chemistry III, Qualitative Analysis with laboratory work	2	
	Biology III, General Zo- ölogy	3		Geology I and II, Gen- eral Geology	3	
	Botany II, Elementary with laboratory work..	3		Geology III, Economic Geology.....	1	
{	Botany III, General Bot- any	1	{	Mathematics II, Deter- minants and Modern Geometry.....	1	
	Botany VI, Economic Botany	4		Mathematics IV, Differ- ential and Integral Cal- culus.....	5	
	Mechanics with experiments.....	1				
{	Physics I, Elementary—major course—with laboratory work	3				
	Physics II, Elementary Physics—minor course—with labor- atory work.....	11				
	Physics III, Light and Heat.....	3				
	Physics IV, Higher Physics.....	4				

Subjects of study elected by Special students :

Astronomy.....	1	Language.....	1
Biology.....	1	Latin.....	17
Botany.....	1	Literature.....	4
Chemistry.....	10	Logic.....	3
English.....	15	Mathematics.....	24
French.....	20	Philosophy.....	6
Geology.....	1	Physics.....	4
German.....	26	Political Economy.....	6
Greek.....	6	Rhetoric.....	25
History.....	22	Spanish.....	2

FREE AND REDUCED TUITION.

Under the Statutes free or reduced tuition may be granted on the ground of character, ability, and need combined. The total number of students receiving free or reduced tuition must not exceed ten per cent. of the total number of students. No free or reduced tuition may be granted to any student during the first year of his connection with the College.

These regulations did not affect the classes entering in 1891-2.

The numbers enjoying free or reduced tuition during the past academic year in the several classes were :

In the Senior Class.....	9
In the Junior Class.....	10
In the Sophomore Class.....	8

The number of students granted reduced tuition was 2.

SCHOLARSHIPS.

There are also established in the College the following Scholarships, entitling the holder to free tuition :

Schermerhorn Scholarships.....	5
Moffat Scholarships.....	2
Alumni Scholarships.....	4
Of the Society for Promoting Religion and Learning.....	8
Alumni Prize Scholarship.....	1

The above-named Scholarships were all filled during the past year, except four of the Society for Promoting Religion and Learning.

ENTRANCE EXAMINATIONS.

The whole number of applicants for admission, who were examined in the week ending June 9, 1894, was 159, distributed as follows :

Preliminary : Intending to enter College in October, 1895..	64
Final: Having taken the preliminary examination in June, 1893.....	59
Full: Taking the whole examination in June, 1894.....	26
Partial.....	3
Special Students.....	7
	<hr/>
	159

OFFICERS OF INSTRUCTION.

Professors.....	19
Adjunct Professors.....	5
Instructors.....	8
Tutors.....	9
Lecturer.....	1
Assistants.....	5

Respectfully submitted,

HENRY DRISLER,

Dean.

June 30, 1894.

SCHOOL OF LAW

REPORT OF THE DEAN

FOR THE ACADEMIC YEAR ENDING JUNE 30, 1894.

*To the President of Columbia College
in the City of New York:*

SIR:

I have the honor to submit the following report of the work of the Law School for the academic year ending June 30, 1894.

The important educational event of the year was the appointment of two additional professors of Law. These appointments were made not for the purpose of increasing the amount of instruction to be offered, but to decrease the amount of work done in the lecture room by the various members of the Faculty, with a view to enabling them to devote more time to the work of original investigation. It is this recognition of the twofold character of the work of a law professor more than the strengthening of the Faculty at this time that makes the appointments an event of educational importance. The Trustees were fortunate in being able to appoint to the new professorships Henry P. Starbuck, Esq., and George F. Canfield, Esq. Both of these gentlemen are members of the New York Bar of several years' standing, and were at the time of their appointment connected with the School as lecturers.

The following table gives the subjects taught during the year 1893-4, the names of the instructors, the number of lectures given per week in each subject, and the number of students examined therein for a degree:

Instructors.	Courses.	Hours per week.	Number of Students.
<i>First Year.</i>			
Mr. Starbuck.....	Common Law Pleading and Procedure.....	2*	60
Prof. Keener.....	Contracts.....	3	64
Prof. Moore.....	Criminal Law and Pro- cedure.....	2	61
Prof. Cumming...	Law of Persons and Domestic Relations.	2*	60
Prof. Keener...	{ Elements of Jurispru- dence.....	1*	64
	{ Equity.....	1*	64
Prof. Kirchwey...	Real and Personal Property.....	3	59
Prof. Burdick.....	Torts.....	2	61
<i>Second Year.</i>			
Prof. Goodnow...	Administrative Law...	2	2
Prof. Burdick.....	Agency.....	2	45
Prof. Cumming...	Bailments.....	2	9
Mr. Green.....	Code Practice.....	2*	17
Prof. Burgess.....	Comparative Constitu- tional Law.....	2	7
Prof. Cumming...	Contracts and Quasi- Contracts.....	3	60
Prof. Keener.....	Equity.....	3	51
Mr. Terry.....	Equity Pleading and Procedure.....	2*	30
Prof. Smith.....	History of European Law.....	2	0
Mr. Richards.....	Insurance.....	2*	11
Prof. Kirchwey...	Real and Personal Property.....	3	51
Prof. Burdick.....	Sales of Personal Prop- erty.....	2	48
<i>Third Year.</i>			
Mr. Green... ..	Code Pleading and Practice... ..	2	26
Prof. Smith.....	Conflict of Private Law	1	0
Mr. Canfield.....	Doctrines Peculiar to New York Law.....	1	1
Prof. Keener.....	Equity.....	2	70
Prof. Kirchwey...	Evidence.....	2	73
Prof. Moore.....	International Law ...	2	3
Prof. Goodnow...	Law of Taxation.....	2	1
Prof. Goodnow...	Municipal Corporations	1	1

* For half the year.

Instructors.	Courses.	Hours per week.	Number of Students.
Prof. Burdick.....	Negotiable Paper.....	2	66
Prof. Burdick.....	Partnership.....	2	52
Prof. Cumming...	Private Corporations..	2	68
Prof. Cumming...	Suretyship and Mort- gage.....	2	50
Prof. Smith.....	Systematic Jurispru- dence.....	2	0
Prof. Kirchwey...	Wills and Administra- tion.....	2	33

Two hundred and seventy (270) students registered in the School during the year just closed, divided into classes or groups as follows:

Post-Graduate Students.....	1
Third-Year Class.....	69
Second-Year Class.....	63
First-Year Class.....	79
Special Students.....	35
Seniors in the School of Arts.....	20
Students from the School of Philosophy.....	1
University Fellows.....	2
Total.....	270

The following is the result of the examinations of candidates for a degree held at the close of the year:

One candidate presented himself for examination for the degree of Master of Laws and received the degree.

Of the sixty-seven members of the third-year class who presented themselves for examination five failed in one or more subjects and therefore failed to receive a degree.

Of the twenty Seniors in the School of Arts who presented themselves for examination three failed in one or more subjects.

The Lecturers and Prize Lecturers have satisfactorily discharged their duties.

Annexed hereto will be found tables showing the percentage of college graduates in each class and in the School as a whole, and the parentage of college degrees.

Respectfully,

WILLIAM A. KEENER,

Dean.

PARENTAGE OF COLLEGE DEGREES.

	Graduates.
Amherst College.....	1
Brown University.....	1
Buchtel College, O.....	1
College of the City of New York.....	24
College of New Jersey.....	1
Columbia College.....	20
Columbian University, Washington, D. C.....	1
Cornell University.....	3
Detroit College.....	1
Georgetown College.....	3
Harvard University.....	20
Hobart College.....	1
Johns Hopkins University.....	1
Kenyon College.....	1
Marietta College.....	1
Michigan Agricultural College.....	1
Notre Dame University, Ill.....	1
Olivet College.....	1
Polytechnic Institute, Brooklyn.....	2
Rutgers College.....	1
Seton Hall College.....	1
Spring Hill College.....	1
St. John's College, Md.....	1
St. John's College, New York.....	1
St. Francis Xavier's College, New York.....	5
Trinity College, Conn.....	1
Union College.....	1
University of Cincinnati.....	1
University of North Carolina.....	1
University of Oregon.....	1
University of Rochester.....	1
University of South Carolina.....	1
University of Toronto.....	1
Westminster College, Pa.....	1
Williams College.....	1
Yale University.....	9
36 colleges and universities. Graduates.....	114

SCHOOL OF MEDICINE

REPORT OF THE DEAN

FOR THE ACADEMIC YEAR ENDING JUNE 30, 1894.

*To the President of Columbia College
in the City of New York :*

SIR :

I have the honor to submit the following report on the work of the College of Physicians and Surgeons for the year 1893-94.

There have been in attendance during the year 782 students, an increase of 121 over the previous year. Their residences appear in the general catalogue. Out of this number 292 held degrees as follows :

A.B.....	160
B.S.....	46
M.D.....	26
Ph.G.....	18
A.M.	12
Ph.B.....	10
A.B., M.D.....	2
A.B., A.M.....	3
A.B., Ph.D.....	1
B.S., A.M.....	1
E.M., C.E.....	1
B.S., M.D.....	1
B.S., A.M.....	1
M.E.....	1
B.Sc.....	2
C.E.....	2
B.S.A.....	2
M.B.....	1
B.P.....	1
E.....	1
Total.....	292

The University Faculty of Medicine consists of :

Professors.....	11
Clinical Professors.....	8
Clinical Lecturers.....	5
Instructors.....	4
Demonstrators.....	3
Assistant Demonstrators.....	7
Clinical Instructors.....	10
Assistant Instructors.....	9

The instruction in the Department of Anatomy has been carried on under the following divisions :

I. Lecture course, three hours a week, Prof. Huntington.

The course has, during the session just completed, dealt with the descriptive and topographical anatomy of the body-cavities, and has been supplemented by several additional lectures and lantern demonstrations on the development and comparative morphology of the alimentary tract.

II. Demonstration course to sections of the class.

a. Second-year students, Dr. Gallaudet.

Five hours a week, covering the anatomy of the Larynx, Pharynx, Auditory Apparatus, and the Central Nervous system.

b. First-year students, Dr. Sands.

Six hours a week, on Cranial Osteology, the Osteology, Syndesmology, and Myology of the extremities.

The value of the instruction given to small sections of the class in these demonstrations has continued to be evident in every way, and the Department looks forward with much confidence and gratification to the increased opportunities for section teaching in Anatomy made available for the next session by the provisions of the four-years' course.

III. Laboratory work in Practical Anatomy.

The unusually large size of both the first- and second-year classes has rendered the practical administration of this instruction a matter of some difficulty, and the fact that the work has been carried to a complete and satisfactory termination for the entire session is highly to the credit of the thorough and sound system introduced by the present

Demonstrator of Anatomy, Dr. Gallaudet, and to the manner in which he and his staff of assistant demonstrators have followed the same.

The wisdom of enlarging the space of the Dissecting Room, thus adding six tables, and the great advantage obtained through the adoption of the cold-storage system, have been most completely demonstrated during this session.

The cold-storage plant has proved itself an admirable success, both in the perfect preservation of anatomical material for indefinite periods, and in the opportunity which it affords of supplying pure and cool air to the dissecting room during the warm months at the beginning and close of the term.

It has been possible, by this means, to continue the work of the class in practical anatomy this year until May 26th, whereas in former years the average time for stopping work ranged between April 15th and 23d, the high temperature of the room preventing further extension of the practical instruction.

It is believed that a few minor changes in the ventilating apparatus of the room, and the exclusion of the direct rays of the sun by awnings over the sky-light, will still further increase the cooling power of the plant, and practically render the Dissecting Room independent of high outside temperatures. The Department finds every reason for continuing to hold the value of the Practical Examinations in Anatomy in high esteem. The examinations add very considerably to the duties of the Demonstrator of Anatomy, but the great advantages attained in estimating the student's knowledge by this means certainly warrant the expenditure of time. The general standing obtained in these examinations by both first- and second-year students has been higher than ever before, and has afforded much gratification to the officers of instruction.

The work of the Department in Research, and the contributions to the Museum of Human and Comparative Morphology, have progressed favorably with the increased facilities afforded by the new laboratory for morphological

Research and the cold-storage plant. During the session 1893-94 the following researches have been carried on, and in part completed :

Muscular variations of the shoulder and upper extremity.

Morphology of the Genito-urinary tract of Primates.

Vascular supply of lobulated kidneys and its relation to the renal ducts.

Visceral anatomy of *Manatus americanus*.

The following papers have been published :

George S. Huntington—Morphology of the Biceps flexor cubiti, and the significance of some of its variations. (*Annals N. Y. Academy of Sciences*. In press.)

F. J. Brockway—The Tibio-femoral articulation of *Elephas indicus*. Presented to the Alumni Association of the College of Physicians and Surgeons.

Dr. Brockway, Alumni Association Fellow in Anatomy, has also carried on an extensive research on the morphology of the Mammalian Lung, and on the variations in the structure of the humero-scapular articulation in reference to the comparative morphology of the joint.

Dr. L. J. Mason, as special worker in the Research Laboratory, has continued his studies in comparative myology and neurology, dealing with the appendicular muscles and nerves of the genus *Macacus*.

Dr. Young has commenced a research on the comparative myology of plantigrade Carnivora and Marsupials, and Dr. William B. Noyes has engaged in a study of the arterial circulation of the Brain in the human subject.

The Department was represented by several exhibits in the First Annual Exhibition of the New York Academy of Sciences held in the Library of Columbia College in March of the present year.

The accessions to the Museum of Human and Comparative

Morphology have been numerous and important. During the session 619 preparations have been added to the collection. The Department is under great obligations to President Low for his generous contribution to the equipment and to the museum of a portion of the German Educational Exhibit at the World's Fair, purchased by him and presented to the Department, including among other objects the giant microtom of Schultze, the cast of the Virchow-Waldeyer "Muskelmann," and the fish-hatching apparatus of Valette.

The comparative and embryological material received by the Department during the year has been unusually abundant and valuable. It includes perfect specimens of *Simia satyrus*, *Pithecia satanas*, *Manatus americanus*, *Myrmecaphaga jubata*, important accessions of South American and African reptiles and fishes, and some extremely important early human embryos from the Society of the New York Lying-in-Hospital, and from outside sources.

The closer connections established by the intervention of President Low with the American Museum of Natural History have resulted in great benefit to the Department. Much valuable material has already been received, and the prospect of continued accessions from this source is favorable. The Department is much indebted to the courtesy of the officials of the American Museum.

The connections which the Department has established for obtaining human and comparative anatomical material, and the unequalled facilities possessed for its preservation, render it possible to offer exceptional advantages for research work and for elective courses in morphology.

In the Department of Physiology Human Physiology as related to that of lower mammals and of other vertebrates, has been attended as an elective study by seven Seniors of the School of Arts, and, as a required study by 516 candidates for the degree of M.D.

Laboratory work as an optional course has been done by two students under the Faculty of Medicine, and by one student under the Faculty of Philosophy.

Laboratory facilities have been extended to a Professor of Physiology from another city during a visit to New York.

Research has been carried on by one candidate for the degree of Ph.D., and by five special workers, all of them Doctors of Medicine.

The following is a list of the subjects investigated :

- Phloridzin Glycosuria ;
- The influence of the Vagus upon the formation of sugar in the liver ;
- The circulation of the kidney ;
- The cardio-pleurogram, and the nature of the cardio-pneumatic movements ;
- The histological changes in the acting nerve-cell ;
- The mechanism of secretion ;
- The rate of absorption ;
- The physiology of the thyroid gland.

The publications of the year comprise the following :

- F. S. Lee—A study of the sense of equilibrium in fishes, I.
Journal of Physiology, vol. xv.
- The same, II. (In press.)
- The scope of modern physiology. *The American Naturalist*, May and June, 1894.
- P. A. Levene—Studies upon Phloridzin Glycosuria. (In press.)
- S. J. Meltzer—The cardio-pleurogram and the nature of the cardio-pneumatic movements. (In press.)
- Eine luftdichte Pleuralcanule. (In press.)

In accordance with the suggestions of the Committee appointed by the Columbia University Press, arrangements are now being made for the issue of a series of studies from the Department of Physiology. Each volume will consist of reprints of articles published by the research workers of the laboratory.

The mechanical equipment of the physiological laboratory has been increased during 1893-94 by the purchase of a twelve-inch steam lathe to supplement the smaller lathe already in use ; and by the replacing of the steam-engine by one of nearly double its power.

In the Department of Pathology the routine work for the current year has involved the systematic practical laboratory instruction of 177 men in Pathology and Bacteriology, and of 270 men in Normal Histology.

Five post-graduate students have received special instruction in advanced Pathology; four in Bacteriology. Three men, two of them Alumni Fellows, have pursued special lines of research. Two candidates for higher degrees in the School of "Pure Science" have been afforded opportunity for special study in bacteriology.

Dr. Park, Alumni Association Fellow, has, in connection with his laboratory work, been engaged in the service of the Health Department of New York City in the practical application of some new methods devised by him for the early diagnosis of diphtheria by bacterial cultures. Dr. Lambert, also Alumni Association Fellow, has studied the cause of an outbreak of infectious disease in rabbits, and has made a study of the variation in virulence of the *Bacillus coli* commune.

The third volume of reprints embodying the results of special investigations pursued by workers in this department during the collegiate year 1892-93 was used early in the present year.

The following papers not mentioned in the report for the last year have been published.

On the Importance of Vibration to Cell Life, by

S. F. Meltzer, M.D.

A Study of the Leucocytosis of Lobar Pneumonia, by

James Ewing, M.D., Assistant in Histology.

On the *Ætiology* of Appendicitis, by

Eugene Hodenpyl, M.D., First Assistant in Pathology.

A Consideration of Artesian Well and Surface Waters from the Standpoint of Bacteriology and Public Health, by

Timothy Mattack Cheesman, M.D., Instructor in Bacteriology.

Tuberculosis and its Prevention and the Need of a National Health Bureau in the United States, by

T. Mitchell Prudden, M.D.

The Professor of Pathology has this year been assigned a position in the Faculty of Pure Science, representing the courses in Bacteriology in the University, leading to the higher degrees.

In the Departments of *Materia Medica* and Practical Medicine the usual didactic lectures have been given by Professors Peabody, Delafield, and Starr, in the College building. Regular clinical instruction in medicine has also been given by Professor Peabody in the wards of the New York Hospital, and by Dr. Delafield at the Roosevelt Hospital. The attendance of students at these clinics has been unusually large.

In the Department of Surgery instruction has been given by didactic lectures—three a week, by Professors Bull and Weir—in the College building, as well as practical teaching in the amphitheatre of the Vanderbilt Clinic, once a week. This latter teaching is highly prized by our students, and it is proposed in the near future that an additional hour of similar instruction be afforded them. As a supplement to this practical work in the department, courses of instruction in minor surgery and bandaging have been given by Dr. B. F. Curtis to the entire second- and third-year classes, in sections.

In the ensuing year the Professors of Surgery will aim to develop, as much as possible, this method of object teaching not only in the Vanderbilt Clinic, but also in the out-patient department of other dispensaries.

The didactic lectures have been illustrated by an extensive set of new diagrams and wax models by Trammond of Paris.

The greatest development aimed at has been in clinical teaching at the hospitals with which the Professors of Surgery are connected. At the New York Hospital, Professors Bull and Weir have held two clinics a week throughout the session, and made special efforts to utilize, for the benefit of the students, the opportunities afforded by this, the leading surgical hospital of the country. As a result the attendance, though the hospital is situated at a considerable distance from the College, has been doubled.

The large number of surgical cases and operations presented at the Syms Operating Theatre of the Roosevelt Hospital, by Professor McBurney, has afforded most ample material for teaching. The clinical field has during the year been still further enlarged by the appointment of Dr. McCosh as Clinical Lecturer on Surgery at the Presbyterian Hospital, while at Bellevue Hospital surgical instruction has been given by Drs. Markoe and Gallaudet.

The establishment of an Orthopedic Department in connection with the chair of Surgery, under the care of Dr. Gibney as lecturer and Dr. Whitman as instructor, marks an important onward step in the surgical teaching of the College. Dr. B. F. Curtis, Instructor in Surgery at the Vanderbilt Clinic, has resigned, and Dr. Ellsworth Eliot, Jr., been appointed to fill the vacancy.

In the Department of Obstetrics and Gynecology the didactic lectures have been given by Professors McLane and Tuttle, supplemented by gynecological operations performed in the presence of the class, in the McLane Operating Room of the Roosevelt Hospital, by Professor Tuttle, and systematic bedside instruction and regularly conducted examinations at the Sloane Maternity Hospital, by Dr. Tucker, the Instructor in Obstetrics. During the College year there have been 870 confinements in the Sloane Hospital, with five deaths, three of which were ambulance cases, the patients being moribund when admitted. More than half the patients were admitted in labor. The Senior class was divided into sections of seven men, each section being on duty for seven days.

During twenty-nine weeks one hundred and eighty-seven (187) students were instructed, each student on an average examining 23 patients and witnessing 15 labors.

They also received instructions on the manikin, and made the daily morning visit to the lying-in wards with the resident physician and house staff. At least six hours daily were devoted to the students, in addition to the time they spent in witnessing deliveries. The instructor in obstetrics has given in addition a half-hour clinical lecture every morning,

and held an examination every Saturday on the work of the week.

Special courses of instruction, of four weeks each, were given to 16 physicians and advanced students.

Twelve physicians, graduates of the College, have each served three months, as assistant resident physician. Each witnessed about 220 labors, and personally delivered 65 women.

Thirty-five nurses from the New York, St. Luke's, and the Presbyterian Hospitals have each received a three months' training in obstetric nursing; attended 48 lectures on nursing by members of the house staff, and 52 lessons given by the principal of the training-school. The value of the hospital as an educational institution can hardly be overestimated—furnishing as it does each year to this city and country, not only a number of experienced obstetricians, but also to the community a large number of nurses, highly competent to take care of women in confinement.

Clinical teaching by sections, in the Vanderbilt Clinic, has been the past year more successfully pursued by the clinical professors, in the various departments of medicine and surgery. The appreciation of the value of this method of instruction by our students is shown by the large attendance upon courses which are optional. The material for clinical instruction at this institution is steadily increasing—129,444 patients having been treated gratuitously during the year 1893.

In conclusion, I would say that the work of our students has been faithfully and satisfactorily performed. Our numbers increase, as our advantages, through the generous support of Columbia, multiply, taxing the accommodations in some of our departments to the utmost. Much time and thought have been given during the past year by this Faculty to the arrangement of the work to be required of our students under the new four-year curriculum, to begin next October. The year 1894 will mark a most important era in the history of the College.

Respectfully,

JAMES W. McLANE,

Dean.

SCHOOL OF MINES

REPORT OF THE DEAN

FOR THE ACADEMIC YEAR ENDING JUNE 30, 1894.

*To the President of Columbia College
in the City of New York :*

SIR :

I have the honor to present the following report of the thirtieth annual session of the School of Mines, just closed.

During the year three hundred and eighty (380) students have been in attendance on the exercises of the School of Mines, distributed as follows :

Undergraduate Courses.

Fourth Class	45
Third "	70
Second "	71
First "	139
	<hr/>
	325

Post-Graduate Courses.

Electrical Engineering :	
Second Class.....	8
First "	2
	<hr/>
	10

Brought forward..... 335

University Courses.

For the Degree of Master of Arts..... 8
 ————— 8

Elective Courses.

Specials..... 38
 ————— 38

(28 of whom pursued Architectural Courses)

Fellows..... 2
 ————— 2

Total..... 383

Deduct for students taking more than one course. 3
 —————

Grand total..... 380

The undergraduate students have pursued the different courses in the School of Mines as follows:

	First Class.	Second Class.	Third Class.	Fourth Class.	Total.
Mining Engineering.....	16	15	16	5	52
Civil Engineering.....	27	15	23	15	80
Electrical Engineering.....	53	17	13	3	86
Metallurgy.....	1	1	1	1	4
Geology and Palæontology.	0	0	0	1	1
Chemistry....	13	5	4	5	27
Architecture.....	29	18	13	15	75
	—————	—————	—————	—————	—————
Total.....	139	71	70	45	325

Of the above-mentioned students the following number received free tuition:

First Class.....	0
Second “.....	16
Third “.....	18
Fourth “.....	8
Post-Graduate.....	0
	—————
Total.....	42

The following is a complete list of the degrees awarded in the several courses:

Undergraduate Courses.

In Mining Engineering.....	5
Civil Engineering.....	15
Electrical Engineering.....	3
Geology.....	1
Chemistry.....	5
Architecture.....	14
	<hr/> 43

Post-Graduate Courses.

Electrical Engineering.....	9
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University Courses.

Master of Arts.....	1
Doctor of Philosophy (old regulations).....	6
	<hr/>
Total.....	59

Graduates of other institutions to the number of fifty-two have been in attendance at the School of Mines during the past year. The following is a list of the institutions from which they graduated, and the degrees which they have received:

PARENTAGE OF DEGREES.

Amherst College, Amherst, Mass.....	1
Augustana College, Rock Island, Ill.....	1
Brooklyn Polytechnic Institute, Brooklyn, N. Y....	1
Colgate University, Hamilton, N. Y.....	1
College of the City of New York.....	13
College of Pharmacy, New York.....	1
College of Pharmacy, Philadelphia, Pa.....	1
Columbia College.....	9
Harvard College, Cambridge, Mass.....	3
Massachusetts Institute of Technology, Boston, Mass.....	1
Pennsylvania College, Gettysburg, Pa.....	1
Princeton College, Princeton, N. J.....	2
Shurtleff College, Upper Alton, Ill.....	1
Stevens Institute, Hoboken, N. J.....	2

Union College, Schenectady, N. Y.	1
University of California, Berkeley, Cal.	1
University of the City of New York.	1
University of Vermont, Burlington, Vt.	1
United States Military Academy, West Point, N. Y.	1
Washington and Jefferson College, Washington, Pa.	1
Williams College, Williamstown, Mass.	1
Yale College, New Haven, Conn.	7

Foreign Countries :

Institute Provincial de Guipuscoa, Vergara, Spain..	1
Nuestra Senora de Montserratte, Cienfuegos, Cuba.	1
University of Havana, Havana, Cuba.	1

55

Deduct for students holding more than one degree 3

52

Number holding degree of A.B.	22
“ “ “ “ A.M.	3
“ “ “ “ B.S.	17
“ “ “ “ C.E.	2
“ “ “ “ E.E.	1
“ “ “ “ LL.B.	1
“ “ “ “ Mech.E.	2
“ “ “ “ M.S.	1
“ “ “ “ Ph.B.	4
“ “ “ “ Ph.G.	2

55

Deduct for students holding more than one degree 3

52

Instruction has been given in the different departments in accordance with the statement made in the Handbook of Information.

The following matters seem worthy of special mention :

DEPARTMENT OF ARCHITECTURE.

Mr. George O. Totten, Jr., Assistant in Architecture, having obtained in competition one of the McKim Travelling Fellowships, resigned his place as Assistant in Architecture.

at the end of the last year. Charles P. Warren, A.M., of the Class of 1890, was appointed in his place. There has been no special change in the course, and no noticeable accessions to the apparatus of instruction.

The material obtained in Chicago through Mr. F. A. Schermerhorn's continued liberality was of too bulky a character for our present quarters, and is stored until the time when it can be set up and used.

DEPARTMENT OF ASTRONOMY.

The summer school in practical geodesy for the students in the course of civil engineering who had completed their third year was conducted by Professor Rees, with Mr. J. T. Monell as Chief Assistant, and Messrs. Gregory and Provot. The first three weeks of instruction were given at the Observatory. The last three weeks were spent at Cooperstown, N. Y., in geodetic field work. There has been added to the instruments of the department a reflecting circle, stand, and horizon of Wanschaff of Berlin.

DEPARTMENT OF CHEMISTRY.

The Chemical Department was re-organized at the beginning of the present year by the appointment of Dr. P. de P. Ricketts as Professor of Analytical Chemistry and Assaying, and the placing under his supervision of the qualitative, quantitative, and assay laboratories. Minor changes were also made in the duties of tutors and assistants. The new arrangement has proved very satisfactory, and it is believed that the efficiency of the department has been very much increased by the change. The laboratories have been very much overcrowded for several reasons :

1st. The destruction of the old building made it necessary to find room in the qualitative laboratory for students of the fourth class in organic chemistry.

2d. A large number of students in the School of Arts, who have elected chemistry, has made it necessary to pro-

vide accommodations for a large number of Sophomores, Juniors, and Seniors in the quantitative laboratory.

3d. More than forty of the students of the first year elected the course in electrical engineering, which calls for laboratory instruction in qualitative analysis.

Everything possible has been done to make this large number of students comfortable in the laboratory, but the overcrowding has been very serious.

An equally objectionable overcrowding has been necessary in the Chemical lecture room. The seating capacity of the room is less than a hundred, and there have been one hundred and thirty-seven students in the first class, and a very large number of Sophomores, Juniors, and Seniors have elected general chemistry. It was necessary to divide the students and repeat all the lectures, but even with this arrangement it was hardly possible to accommodate the classes, and there were great complaints of the lack of proper ventilation.

Valuable additions have been made to the instruments and specimens employed in the laboratory, and for lecture illustration, some by gift and others by purchase.

DEPARTMENT OF ENGINEERING (CIVIL).

Professor W. H. Burr entered upon his duties as the head of this department at the beginning of the year, and all the courses of instruction provided for in the Handbook of Information have been given. A very considerable addition has been made to the equipment of the department by the purchase of a number of transits, levels, and other surveying instruments for the accommodation of the students in their field work. Through the gift of the President and several prominent civil engineers and other friends, a number of valuable photographs of plans and specifications of some of the most important engineering works of this and other countries have been added to the collection of the department for the use of the students, and a considerable addition

has also been made to the library of engineering works. A course of three lectures by prominent non-resident specialists on roads and foundations was given during the spring, and was attended by a large number of students. This plan of inviting specialists to lecture to the students has proved a great success, and it is intended to continue it to a somewhat larger extent during the winter.

DEPARTMENT OF ENGINEERING (ELECTRICAL).

The substitution of a regular four-years' course for the degree of electrical engineer has proved to be a great improvement upon the plan previously pursued of admitting special students to selected studies in electricity.

The profession of the electrical engineer has become so clearly defined, that the addition of a little electricity to the studies of the civil engineer or mechanical engineer no longer answers the purpose.

The demand for this course of instruction is indicated by the fact that of the 380 students who have attended the School of Mines during the past year, 86 have taken the regular four-years' course in electrical engineering, while there have been in addition to this number ten post-graduate students in electrical engineering.

To comply with the demands for a graduating thesis the fourth-year students have made a very thorough examination of an electrical railway plant in Brooklyn. This is a new departure, and seems to be a very successful method for bringing the students into contact with the practical world.

There has been no change in the staff organization of the department.

DEPARTMENT OF ENGINEERING (MECHANICAL).

The only changes in the assignment of duty incident upon the formation of a permanent organization of the department of mechanical engineering were the organizing of a

course of instruction in locomotive engineering under Mr. Woolson, and a course of six lectures on pumping engines for water-works in the fourth year by Professor Hutton. There has also been a regular afternoon course in testing materials for students of the third class in all courses of engineering. This work has embraced tests of tensile, compressive, and transverse strength of wood, wrought iron, and steel. The instruction has been given under the supervision of Mr. Gregory, Assistant. The mechanical laboratory has this year been made available for the pursuit of original investigations by students of the graduating class who have selected graduating theses in this department. This bids fair to open a most useful field of development for the school. The increase of the number of students requiring instruction in drawing in the first and second years has made necessary the creation of an assistant in drawing. Mr. F. A. Provot has been appointed to fill this position. The department has this year for the first time had to provide for instruction in advanced drawing for the students of electrical engineering. This has been given under the supervision of Instructor Woolson.

Students in the department have this year participated in a boiler and engine test of an electric street railway plant in Brooklyn as part of their school drill in mechanical engineering, co-operating with students in electrical engineering, who were in charge of the electric measurements.

The following additions have been made to the equipment of the department by gift:

A testing machine of the Riehlé pattern of 100,000 pounds' capacity, being a gift from certain Alumni of the School and friends of the department. This represents a value of \$1600. A subscription of \$650 in cash is in hand for the purchase of an additional testing apparatus when the necessary amount shall have been completed. Also gifts of steam-boiler injectors, which have been mounted so as to be used and tested. Also by gift an extensive series of framed illustrations of engines, tools, and the like which formed part of the exhibit of "Engineering" of London at

the Columbian Exposition. These were the gift of the President of the College to the department.

The sum of \$100 has also been presented to the department for the purchase of books for the library in its specialty.

By purchase :

A Webber dynamometer and an Alden dynamometer for the measurement of power transmitted by motors or to machines.

Three pairs of steam-engine indicators with accessory apparatus, to measure performance of steam-engines.

Three specially constructed tanks with weirs, outflow valves, and mounted upon scales for determining the quantities of water discharged by hydraulic apparatus and used by engines in the form of steam.

Apparatus for the calibration of anemometers.

There has also been considerable increase in the numbers of the subsidiary apparatus, test-gauges, calorimeters, and the like.

DEPARTMENT OF GEOLOGY.

Mr. C. A. Hollick was promoted the 1st of July from the position of Assistant to Tutor in geology, and Mr. Gilbert van Ingen was placed in charge of the Museum.

The Museum: In 1892-3 all the specimens of the collections in geology and palæontology were numbered (with a painted number on each), and card indexed. The past year the fossils have been carefully revised by Mr. van Ingen, re-determined where lacking a label, sorted out and recorded. They were in great confusion, and have been revised from the earliest up through the Upper Silurian. We expect to complete the Devonian before the vacation, and the remainder next year.

Mr. Hollick has taken charge of the fossil plants and systematically arranged and determined them. We possess a vast amount of material, but it has been scattered wherever our specimens were stored.

In connection with the work of Dr. Dean of the Biological Department, some valuable additions of fossil fish have been obtained. They were purchased by the aid of Mr. F. A. Schermerhorn of the Board of Trustees. Many minor additions have also been received.

Equipment: In anticipation of the new work next year on the microscopic determination and study of rocks, five petrographical microscopes have been purchased. About five hundred lantern slides have been also added to our teaching material.

Instruction: A new elective in geology was offered by Mr. Hollick to students in the School of Arts involving two hours a week through the year. It was taken by twelve students. Some fifteen excursions to points of geological interest were made on Saturdays and holidays. They have attracted varying numbers from five to thirty. School of Mines men are as a general thing too closely confined on Saturdays to get away.

A week's instruction is now regularly given in field geology to the Summer School in Mining by the Professor of Geology. Last summer it took place at Franklin Furnace, N. J.; the coming summer it will take place on Keweenaw Point, Lake Superior. All the members of the Geological Department were in the field at least two months, part of the time with several students, and in this were much aided by the summer-school appropriation.

Publications: The department has adopted the method of issuing its reprints of publications under a regular cover and in numbered sequence. No. XIII and Nos. XV to XXI inclusive, have appeared during the current year. Nos. XXII to XXIV are in press.

Mr. Hollick has also revised, and to a considerable degree has re-written, two posthumous manuscripts of Dr. Newberry, one on the "Flora of the Amboy Clays," and the other on the "Later Extinct Floras of North America," and arrangements have been made with the United States Geological Survey by which, certainly the first, and in all probability the second, will be issued.

DEPARTMENT OF MATHEMATICS.

The following changes were made in the corps of instructors :

Clifton N. Windecker, C.E., Assistant, was succeeded by Edwin M. Blake, Ph.D.; and Henry S. Curtis, A.B., Assistant, was succeeded by Arnon L. Squiers, A.B. All the courses of instruction laid down in the Handbook of Information were given as usual, as well as the Elective and University courses.

DEPARTMENT OF MECHANICS.

Professor Robert S. Woodward took charge of the Department of Mechanics at the beginning of the present year. By the reorganization of the work of the Engineering Department, analytical mechanics and thermodynamics were assigned to this department. Analytical mechanics was taught by Professor Woodward and thermodynamics by Professor Pupin.

DEPARTMENT OF MINERALOGY AND METALLURGY.

There has been no change in this department. Valuable additions have been made, mostly by gift to the metallurgical and mineralogical museums; from the Glenboig Company of Glasgow was received a suite of fire brick of their manufacture, and a model of the Dunnachie Kiln. Large crystals of phosgenite from Italy, and the largest known crystal of monazite were added to the mineral cabinet. The systematic measuring and publication of the crystals in the cabinet has been organized and thoroughly pursued during the year.

Owing to the illness of Professor Egleston the metallurgical investigations have been interrupted.

DEPARTMENT OF MINING.

The increase in the number of lectures on mining, contemplated when the department was reorganized three years

ago, has only this year gone into effect. During the year three hundred and eight lectures were given in the department, as compared with two hundred and five in 1890-91, and one hundred and ten in 1886-87. Besides the lectures the students of mining have had over one hundred and fifty hours' afternoon work in the design of mine plant, and about two hundred and fifty hours' work at the mines in the summer school. These changes place the School of Mines in the front rank in the opportunities offered for the study of mining.

Very important additions to the equipment of the department have been made during the year. A number of large elaborate models of mines and mine equipment, aggregating a value of nearly \$8000, were secured from among the exhibits in the Mines and Mining Building at the World's Fair. These models were presented by the exhibitors or purchased from a fund generously placed at the disposal of the department by Mr. F. Augustus Schermerhorn. The St. Joseph Lead Company presented a very elaborate model of their large dressing works at Bonne Terre, Mo., and the Copper Queen Mining Company gave two beautiful models in wood, exhibiting the methods of mining at Bisbee, Arizona. Among the models purchased was the entire exhibit of the Cleveland Cliffs Mining Company of Ishpeming, Mich., comprising two large models of their mines, and full-sized specimens of the timbers used. A Shaw gas tester, an apparatus for determining minute percentages of fire-damp in the air of mines, was purchased.

The collection of mine maps, working drawings, photographs, have received many valuable additions by gift and purchase. Among other things a collection of over one hundred lantern slides of views taken underground by magnesium light is worthy of special mention. Such views are secured with the greatest difficulty, fully 80% of the attempts of the most skilful operators resulting in failure. A collection of one hundred views is thus unique and remarkable. These views have been obtained from Germany, England, and from different parts of this country. The depart-

ment is especially indebted to Mr. Herbert W. Hughes, of Dudley, England, and to two graduates of the School of Mines, Mr. R. M. Edwards, '86, and Professor F. W. Denton, '89, of Houghton, Mich., for a large part of this collection. These underground views have very great educational value, as they exhibit the mine workings much more distinctly than they are ever seen by the dim light of mine lamps.

The Summer School in Practical Mining was held during June and July in New Jersey, Pennsylvania, and at the World's Fair. Two weeks were spent at the iron mines of the Mount Hope Mining Company, Morris County, N. J., and one week in geological work with Professor Kemp at Franklin Furnace in the same county; two weeks at the collieries of Messrs. Coxe Brothers & Company at Oneida, Schuylkill County, Pa., and finally one week in the study of the mining exhibits at the World's Fair.

DEPARTMENT OF PHYSICS.

Two additional assistants have been appointed in this department during the past year: Henry S. Curtis, A.B., and Herbert T. Wade, A.B.

Courses in the Laboratory: The course for electrical engineers has been enlarged and eight hours a week are required instead of six as heretofore. The chemists work two hours a week during both terms instead of only one term.

New Experiments: The following new experiments have been added to the list:

On measurements of length.....	8
On determination of mass.....	15
On measurement of time.....	3
On mechanics and molecular forces.....	9
On sound.....	2
On heat.....	6
On light.....	17
On electricity.....	24

Apparatus added :

- 1 Spherometer.
- 1 Goniometer.
- 1 2000-oz. bullion balance, by Kohlbusch.
- 1 Set of weights, 5 kilo. to 0.01 gr., by Kohlbusch.
- 1 Jolly balance.
- 1 Nicholson hydrometer.
- 3 Pieces of vapor density apparatus, according to Dumas, to Hoffman, and to Meyer.
- 3 Pieces of apparatus for molecular-weight determination, by boiling-point and by freezing-point methods.

(Presented by President Low) :

- 1 Torsion apparatus for moment of inertia.
- 1 Daniell hygrometer.
- 1 August hygrometer.
- 1 Gravimetric hygrometer.
- 1 Air thermometer.
- 1 Ice calorimeter.
- 3 Spectroscopes.
- 1 Apparatus for polarizing angle.
- 1 Saccharimeter.
- 1 Kohlrausch total reflectometer.
- 1 Abbe total refractometer.
- 1 Differential galvanometer.
- 8 Wheatstone bridges (made in laboratory).
- 3 Rheostats (made in laboratory).

Two illustrated lectures on color were delivered before the Architectural Department by Professor Rood at the request of Professor Ware.

CONCLUSION.

The work of the students in all departments has been extremely satisfactory. There has been a large increase in the number of students, the grand total having been 380, while the grand total for the year 1892-93 was 337. Although there has been considerable overcrowding, the work of the School has progressed without any friction. The need of larger and more convenient accommodations is constantly increasing.

Respectfully,

C. F. CHANDLER,

Dean.

SCHOOL OF POLITICAL SCIENCE

REPORT OF THE DEAN

FOR THE ACADEMIC YEAR ENDING JUNE 30, 1894.

*To the President of Columbia College
in the City of New York :*

SIR :

I have the honor to submit the following report of the work of the University Faculty of Political Science for the scholastic year 1893-94.

There have been during the past year 226 students in the School of Political Science. Of these, 151 were also registered in the Law School, 15 in the School of Philosophy, 1 in the School of Pure Science, 1 in the School of Mines, 34 were members of the Senior Class in the School of Arts, 5 pursued studies in the Union Theological Seminary, and 1 in the General Theological Seminary. Of the 226 students in the School, 99 held college degrees on entrance into the School, and 40 others had completed the Junior year of college.

Of the 99 students holding college degrees upon entrance into the School,

65	had the degree of Bachelor of Arts.
12	" " " " " " Science.
4	" " " " " " Philosophy.
2	" " " " " " Letters.
1	" " " " " Civil Engineer.
1	" " " " " Bachelor of Laws.
14	" " " " " Master of Arts, in addition to the Bachelor's degree.

The colleges which sent the greatest number of students to the School of Political Science were as follows:

Columbia.....	59
C. C. N. Y.....	29
Harvard	15
St. Francis Xavier.....	5
Yale.....	5
Cornell University.....	3
Notre Dame University.....	3
Amherst.....	2
Brown University	2
Indiana State University.....	2
Leland Stanford, Junior, University.....	2
Rutgers.....	2
University of Virginia.....	2
Wesleyan University.....	2
Williams College.....	2

Besides these, thirty-one colleges and technical schools, mostly in the South and West, contributed to make up the roll of our students. From foreign countries, there was a representative from the University of Moscow, Russia.

Inasmuch as we have at Columbia made the beginning of the Senior year the commencement of University work, we must add to the 99 students having degrees the 40 other students who have completed the Junior year. There were then 139 University students in full standing attending the work of this School.

COURSES OF INSTRUCTION, 1893-94.

GROUP I.—HISTORY AND POLITICAL THEORY.

A.—European History.

Instructor.	Courses.	Hours per week.	Students.	Total num- ber of stu- dents.
Prof. Osgood	1. General Political and Constitutional History of Europe.	1st session 4	{ 10 A.B., A.M., Ph.D., 19 Sp.	{ 5 1 35

Instructor.	Courses.	Hours per week.	Students.	Total num- ber of stu- dents.
Prof. Osgood	2. The Political and Constitutional History of Eng- land	2	{ 6 A.B., 3 A.M., 1 Ph.D., 9 Sp.	19
Prof. Dunning	3. The Relations of England and Ireland	{ 1st session 1		

(This course was not given during 1893-94.)

B.—American History.

Prof. Burgess	1. Political and Constitutional History of the United States	{ 2d session 4	{ 10 A.B., 9 A.M., 2 Ph.D., 14 Sp.	35
Prof. Osgood	2. Political His- tory of the Colonies and of the American Revolution	{ for 2 years 2	{ 3 A.M., 1 Ph.D., 1 Sp.	5
Prof. Dunning	3. The United States during Civil War and Reconstruction	{ 2d session 2	{ 1 A.B., 3 A.M., 3 Ph.D., 5 Sp.	12
Mr. Whitridge	4. Political His- tory of the State of New York	{ 2d session 2		
Dr. Bancroft	5. New York State and Fed- eral Politics 1820-60	{ 2d session 2	{ 6 A.M., 1 Ph.D., 3 Sp.	10
Dr. Bernheim	6. Charter and Political His- tory of New York City	{ 1st session 2	{ 1 A.B., 3 A.M., 1 Ph.D., 6 Sp.	11

C.—Political Theory.

Prof. Dunning	1. General History of Political Theo- ries	3	{ 4 A.B., 4 A.M., 2 Ph.D., 4 Sp.	14
Prof. Dunning	2. American Politi- cal Theories	1	{ 4 A.M., 2 Ph.D., 3 Sp.	9

GROUP II.—PUBLIC LAW AND COMPARATIVE JURISPRUDENCE.

A.—Constitutional Law.

Instructor.	Courses.	Hours per week.	Students.	Total num- ber of stu- dents.
Prof. Burgess.....	1. Comparative Constitutional Law of the Principal European States and of the United States.....	Dec. to May } 3	{ 12 A.M., 2 Ph.D., 15 Sp.	29

B.—International Law.

Prof. Moore.....	1. History of	1st session	{ 4 A.M., 3 Sp.....	7
Prof. Moore.....	2. Diplomacy....	2		
Prof. Moore.....	2. History of	2d session	{ 5 A.M., 1 Ph.D., 3 Sp.	9
Prof. Moore.....	3. American Diplomacy....	2		
Prof. Moore.....	3. International Law.....	2	{ 5 A. M., 3 Ph.D., 9 Sp.	17

C.—Criminal Law.

Prof. Moore	1. Criminal Law, including the Conflict of Penal Laws and Extradition.	2	{ 12 A.M., 114 Sp.....	126
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D.—Administrative Law.

Prof. Goodnow.....	1. Comparative Administrative Law of the United States and the Principal European States....	2	{ 5 A.M., 7 Sp.....	12
Prof. Goodnow.....	2. The Law of Municipal Corporations	1st session } 2	{ 2 A.M., 2 Ph.D., 5 Sp.....	9

Instructor.	Courses.	Hours per week.	Students.	Total num- ber of stu- dents.
Prof. Goodnow.....	3. The Law of Taxation.	2d session 2	{ 1 A.M. Ph.D., Sp.....	1 3 5

E.—Roman Law and Comparative Jurisprudence.

Prof. Munroe-Smith..	1. Roman Law....	1	{ 3 A.M., Ph.D., 3 Sp.	3 9
Prof. Munroe-Smith..	2. History of Euro- pean Law.....	2	{ 4 A.M., Ph.D., 6 Sp.	3 13
Prof. Munroe-Smith..	3. Comparative Ju- risprudence.....	2	{ 2 A.M., Ph.D., 4 Sp.	2 8
Prof. Munroe-Smith..	4. International Pri- vate Law.....	1	{ 2 Ph.D., Sp.....	12 14

GROUP III.—ECONOMICS AND SOCIAL SCIENCE.

A.—Political Economy and Finance.

Prof. Mayo-Smith...	1. Historical and Practical Political Economy.....	3	{ 16 A.B., A.M., Ph.D., 13 Sp.	19 2 50
Prof. Seligman.....	2. History of Politi- cal Economy. (This course was not given during 1893-94.)			
Prof. Seligman.....	3. Railroad Prob- lems, Econom- ic, Social, and Legal	1st session 2	{ 3 A.M., Ph.D., Sp.....	6 3 12
Prof. Seligman.....	4. Science of Fi- nance.....	2	{ 8 A.B., A.M., Ph.D., 13 Sp.	7 4 32
Prof. Seligman.....	5. Financial His- tory of the United States.	2d session 2	{ 1 A.B., A.M., Ph.D., 2 Sp.	3 7 13
Prof. Seligman.....	6. Industrial and Tariff History of the United States.....	2d session 2		
	(This course was not given during 1893-94.)			

B.—Sociology and Statistics.

Instructor.	Courses.	Hours per week.	Students.	Total num- ber of stu- dents.
Prof. Mayo-Smith...	1. Statistical Sci- ence, Methods and Results.... (This course was not given during 1893-94.)	2		
Prof. Mayo-Smith ..	2. Communistic and Socialistic Theo- ries.	2	{ 4 A.M., 6 Ph.D., 4 Sp..... 14	
Prof. Giddings.....	3. General Soci- ology	{ 1st session 2 2d session 2	{ 10 A.M., 6 Ph.D., 7 Sp..... 23	
Prof. Giddings.....	4. Crime and Pe- nology	{ 2d session 2	{ 10 A.M., 6 Ph.D., 7 Sp..... 23.	

SEMINARIUM IN HISTORY.

Professor Osgood. 20 meetings. 11 members.

Subjects.

The Colonial Charters.....	Mr. Bernstein.
The Political Aspects of Puritanism.	Mr. Cook.
The Forfeiture of the Massachusetts Charter in 1684	Mr. Eisman.
Dutch Colonization... ..	Mr. Friedmann.
The Privy Council	Mr. Hertz.
The Reconstruction Views of Seward and Chase.....	Mr. Knox.
The Governorship of Andros, and the Revolution in England.....	Mr. Kohler.
History of the Election Laws of New York State.	Mr. Reubenstein.
Settlement of Massachusetts.....	Mr. Schmuck.
French Colonization of North America during the 17th and 18th Centuries	Mr. Sweeney.
The New England Confederacy...	Mr. R. W. Thompson, Jr

SEMINARIUM IN AMERICAN COLONIAL HISTORY.

Professor Osgood. 20 meetings. 4 members.

Subjects.

New York Colonial Land Tenure..	Mr. Chadsey.
State Constitutional History in the United States 1720-1785.....	Mr. Cushing.
A History of Proprietary Govern- ment in Pennsylvania.....	Mr. William R. Shepherd.
The Loyalists of New England....	Mr. Bugbee.

SEMINARIUM IN CONSTITUTIONAL LAW.

Professor Burgess. 20 meetings. 11 members.

Through the year.

Subject: The powers of Congress in the government of the Territories, and in the admission of States to the Union, and in the reconstruction of States.

Papers on some phase of this subject were read by Messrs.

Briggs,	Bullowa,	Cook,	Knox,	Stücke,
Brownson,	Carr,	Hertz,	Reubenstein,	Sweeney.

SEMINARIUM IN DIPLOMACY AND INTERNATIONAL LAW.

Professor Moore. 2 members.

Subjects.

Rights of Aliens as to Persons and Property in the United States	Mr. Rawson.
What Constitutes a State of War ?.....	Mr. Cameron.

SEMINARIUM IN POLITICAL THEORIES.

Professor Dunning. 1 member.

Subject.

The Theory of Sovereignty, with Attention to Late Political Theory	Mr. Bullowa.
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PRELIMINARY SEMINARIUM IN ECONOMICS.

Professors Mayo-Smith, Seligman, and Mr. Weston. 10 members.

Once a week through the year. The first half year was devoted to talks and exercises on Practical Statistics, under Professor Mayo-Smith and Mr. Weston. The second half year was devoted to papers and discussions on Bimetallism and on Banking, under Professor Seligman. The subjects were as follows :

Bimetallism in United States.....	Mr. Cushing.
France and the Latin Union.....	Mr. Hall.
Monometallism in England and India.....	Mr. Scott.
The Monetary Conference of 1878.....	Mr. Kondo.
The Monetary Conference of 1881.....	Mr. Snyder.
The English Gold and Silver Commission, 1888.....	Mr. Hamlin.
The Monetary Conference of 1892.....	Mr. Trevor.
The English Banking System	Mr. Sanford.
The French and German Banking Systems..	Mr. Hartranft.
The Banking and Currency System of the United States	Mr. Phillips.

SEMINARIUM IN POLITICAL ECONOMY AND FINANCE.

Professor Seligman. 12 members.

There were twenty meetings. The first half hour of each meeting was devoted to the review of the periodical scientific literature of the subject in England, Germany, France, Italy, The Netherlands, Russia, and America, that of each country being assigned to two members.

The first half of the year was devoted to a study in Theoretical Economics—The Differential Theory of Distribution, and to a study in Practical Finance—The Income Tax. The second half of the year was devoted to a discussion of special topics assigned to each member. The topics discussed at the meetings were as follows :

The Differential Theory of Distribution.

The Differential Theories in the Physiocrats.....	Mr. Churchill.
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The Differential Theories in Adam Smith and Ricardo.....	Mr. Breckenridge.
The Contributions of the English School	Mr. Wolff.
The Contributions of Hermann, Thünen, and Mangoldt.....	Mr. Emery.
The newer views of Marshall, Walker, and Clark.....	Mr. Walker.
The Austrian School.....	Mr. Jacobson.

The Income Tax.

The Theory of Income.....	Mr. Emery.
The Income Tax in England.....	Mr. Kleitzsch.
The Income Tax in Germany.....	Mr. Breckenridge.
The Income Tax in Switzerland and Italy.....	Mr. McLean.
The Income Tax in America.....	Mr. Batchelor.
Progression and Differentiation in Taxation.....	Mr. Weston.

Miscellaneous Papers and Discussions.

Canadian Banking.....	Mr. Breckenridge.
Taxation in Vermont.....	Mr. Wood.
Municipal Debts.....	Mr. Bachelor.
Justice in Taxation.....	Mr. Weston.
The Influence of the Physiocrats on the French Revolution.....	Mr. Jacobson.
Speculation on the Exchanges.....	Mr. Emery.
Double Taxation.....	Mr. Walker.
Financial History of Canada.....	Mr. McLean.
Trusts and Combinations.....	Dr. von Halle.

SEMINARIUM IN SOCIOLOGY.

Professor Mayo-Smith. 10 meetings. 7 members.
The subjects discussed were as follows:

The Assimilation of Races and Nationalities.

- I. Theories of Ethnologists in Regard to Races..... Mr. Churchill.
- II. Theories of Historians in Regard to Effect of Mixture of Races on Political Institutions..... Mr. Wood.

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|--|---------------------|
| III. Theories of Sociologists in Regard to Process of Mixture of Races and Effect on Social Development..... | Mr. Hannah. |
| IV. The History of Colonization in, and Immigration into, the United States..... | Mr. Grannis. |
| V. The Distribution of the Foreign-Born in the United States..... | Mr. Wood. |
| VI. The Relation of the Second Generation of Immigrants to the First..... | General Discussion. |
| VII. Assimilation of Nationalities in the United States by Inter-marriage..... | Mr. Jacobson. |
| VIII. The Assimilating Influence of Education..... | General Discussion. |
| IX. The Assimilating Influence of Political Life..... | General Discussion. |
| X. The Influence on Immigrants of Coming to this Country. | Mr. Hannah. |

In the autumn of 1893 the Hon. Theodore Roosevelt delivered, under the auspices of this Faculty, six public lectures on the "Westward Growth of the United States during the Revolutionary War." These lectures were instructive in matter and attractive in form; and it gives me pleasure to say that they were well attended both by University students and by others.

At the close of the year, twenty-seven candidates for the degree of Bachelor of Arts were certified to the Faculty of Arts as having satisfactorily completed such work as they had undertaken with the Faculty of Political Science, and seven as having completed a portion of such work satisfactorily.

The following candidates for the degrees of Master of Arts and Doctor of Philosophy were recommended during the year by this Faculty to the University Council, as qualified to receive these degrees, insofar as their work had fallen under the jurisdiction of the Faculty of Political Science :

A.—For the Degree of Doctor of Philosophy:

James A. McLean, A.B., '92, University of Toronto ;
A.M., '93, Columbia.

Major subject : Political Economy and Finance.

Minor subjects : Jurisprudence, Sociology and Statistics.

Dissertation : Essays in the Financial History of Canada.

Frederick A. Wood, A.B., '86, Dartmouth College.

Major subject : Political Economy and Finance.

Minor subjects : Sociology and Statistics, American History.

Dissertation : The History of Taxation in Vermont.

Frederick René Coudert, Jr., A.B., '90, Columbia ; A.M., '91, Columbia.

Major subject : Comparative Jurisprudence.

Minor subjects : International Law, Administrative Law.

Dissertation : Marriage and Divorce Laws in Europe.

For the Degree of Master of Arts:

George H. Batchelor, A.B., Indiana University, 1892.

Major subject : Economics and Finance.

Minor subjects : Constitutional Law, Sociology and Statistics.

Essay : Municipal Debts.

Solomon C. Bernstein, B.S., College of the City of New York, 1892.

Major subject : American History.

Minor subjects : European History, Economics and Finance.

Essay : The Colonial Charters.

J. E. Bullen, A.B., Brown University, 1890.

Major subject : United States History.

Minor subjects : European History, Roman Law.

Essay : An Inquiry into our Electoral System.

Malcolm J. Cameron, A.B., '91, Johns Hopkins University.

Major subject: International Law.

Minor subjects: Comparative Jurisprudence, Political Theories.

Essay: What Constitutes a State of War?

Charles Ernest Chadsey, A.B., Leland Stanford, Jr., University, 1892; A.M., 1893.

Major subject: American History.

Minor subjects: European History, Economics and Finance.

Essay: New York Colonial Land Tenure.

Alfred A. Cook, B.S., '92, College of the City of New York.

Major subject: American History.

Minor subjects: Constitutional Law, European History.

Essay: The Political Aspects of Puritanism.

Alexander Griswold Cummins, Jr., B.D., Swarthmore College, 1889.

Major subject: Under the Faculty of Philosophy.

Minor subjects: Under the Faculty of Philosophy; Sociology.

Essay: Realism, a Development in Fiction.

Harry A. Cushing, A.B., '91, Amherst.

Major subject: American History.

Minor subjects: European History, Political Economy and Finance.

Essay: State Constitutional History in the United States, 1720-1785.

Christopher R. Hamlin, A.B., '93, Boston University.

Major subject: Political Economy and Finance.

Minor subjects: Sociology and Statistics; under Faculty of Philosophy.

Essay: The Change in the Value of the Precious Metals.

Emanuel Hertz, A.B., '92, College of the City of New York.

Major subject: European History.

Minor subjects: Comparative Constitutional Law, American History.

Essay: The Privy Council.

Arthur Knox, A.B., '92, College of the City of New York.

Major subject : Comparative Constitutional Law.

Minor subjects : American History, Political Theories.

Essay : The Reconstruction Views of Seward and Chase.

Nathan Ottinger, B.S., '92, College of the City of New York.

Major subject : American History.

Minor subjects : With the Faculty of Philosophy: History
of European and American Diplomacy.

Essay : The Limitation of Debate in the House of Representatives.

Edward Stephen Rawson, A.B., Harvard University, 1890.

Major subject : International Law.

Minor subjects : European Legal History, Comparative
Constitutional Law.

Essay : Rights of Aliens in the United States.

Raymond Reubenstein, A.B., '92, College of the City of
New York.

Major subject : American History.

Minor subjects : Constitutional Law, European History.

Essay : History of the Election Laws of New York State.

William R. Shepherd, A.B., '93, Columbia.

Major subject : American History.

Minor subjects : European History, Constitutional Law.

Essay : A History of Proprietary Government in Pennsylvania.

Robert W. Thompson, Jr., A.B., '93, College of the City of
New York.

Major subject : American History.

Minor subjects : European History, Political Economy
and Finance.

Essay : The New England Confederacy.

During the year the following gentlemen have held Fellowships in subjects falling under the jurisdiction of this Faculty :

George H. Batchelor, A.B.—Finance.

L. G. Bugbee, A.M.—History.

C. E. Chadsey, A.B.—Finance and History.
H. C. Emery, A.M.—Social Science.
W. J. Hannah, A.B.—Social Science.
J. A. McLean, A.M.—Comparative Jurisprudence.
W. R. Shepherd, A.B.—History.
Francis Walker, A.M.—Economics.

The Seligman Fellowship was held by
Frederick A. Wood, A.M.—Economics.

Mr. Batchelor has pursued courses in the Departments of History, Political Economy, Finance, Sociology, Political Theories, and Administrative Law. He has prepared several papers for the Seminarium, and has almost completed a comprehensive thesis on the subject of Municipal Indebtedness in the United States in Theory and Practice.

Mr. Bugbee has pursued courses in the Departments of History, Political Economy, Finance, and International Law. He has prepared several papers for the Seminarium, and has been engaged for a year on a History of the Loyalists during the Revolution.

Mr. Chadsey has pursued courses in the Departments of History, Political Economy, Finance, and International Law. He has prepared several papers on Colonial History for the Seminarium, and is engaged on a dissertation upon the History of Land Tenure in America.

Mr. Emery has pursued courses in the Departments of Political Economy, Finance, Sociology, and Comparative Jurisprudence. He has made various reports to the Seminarium, and is engaged on a dissertation upon Speculation in Produce and Stock Exchanges.

Mr. Hannah has pursued courses in the Departments of History, Political Economy, Finance, and Sociology. He has made several reports to the Seminarium, and is engaged on a dissertation upon Poor Relief in the United States.

Mr. McLean has pursued courses in the Departments of Political Economy, Finance, Sociology, History, and Comparative Jurisprudence. He has made various reports to the Seminarium, and has completed his dissertation on the Financial History of Canada.

Mr. Shepherd has pursued courses in the Departments of History, Political Economy, Finance, Constitutional Law, and International Law. He has made various reports on Colonial History to the Seminarium, and is engaged on a dissertation upon the History of Proprietary Government in Pennsylvania.

Mr. Walker has pursued courses in the Departments of Political Economy, Finance, Sociology, Political Philosophy, Comparative Jurisprudence, and International Law. He has made several reports to the Seminarium, and has almost completed his dissertation on Double Taxation in the United States.

Mr. Wood has pursued courses in the Departments of History, Political Economy, Finance, and Sociology. He has presented various papers to the Seminarium, and has completed his dissertation on the History of Taxation in Vermont.

In addition to these gentlemen, Mr. John M. Littlejohn, University Fellow in Political Theories for 1892-93, who had completed all his courses, continued his investigations during the year 1893-94 in the libraries of Great Britain and Continental Europe, and has almost completed his dissertation on the Political Theories of the Schoolmen.

Of the above-mentioned gentlemen, Messrs. Bugbee and Shepherd were, at the meeting of the University Council, held April, 1894, reappointed to their respective Fellowships for the ensuing year.

It gives me pleasure to state that a comparatively large number of our recent graduates have been appointed to College and University positions throughout the country. The gentlemen who have received such positions during the year 1893-94, are as follows:

Henry Emery, A.M., appointed to the chair of Political Economy and Social Science in Bowdoin College, Maine.

Dr. Ernst Freund, to the chair of Roman Law and Comparative Jurisprudence in the University of Chicago.

Isaac L. Hourwich, to an Instructorship in Statistics in the University of Chicago.

Lindley M. Keasbey, Ph.D., to the Professorship of Political Economy and Social Science in Bryn Mawr College, Bryn Mawr, Pa.

James A. McLean, Ph.D., to the Professorship of History and Political Science in the University of Colorado, Boulder, Colo.

Max West, Ph.D., to a Lectureship in Political Economy in the University of Chicago.

Stephen F. Weston, A.M., to the Professorship of Political Economy in Adelbert College, Cleveland, Ohio.

With the steadily growing number of students and graduates, it may be expected that this gratifying evidence of Columbia's influence will continually increase.

The Series of Studies in History, Economics, and Public Law, under the management of Professor Seligman, completed its fourth volume during the year. The numbers published since my last report are Vol. III., No. 2, "The Colonial Policy of England toward the American Colonies," by George L. Beer, A.M., and Vol. IV., No. 3, "The History of Taxation in Vermont," by F. A. Wood, Ph.D. A large number of additional monographs are now in hand, and will appear during the coming summer and autumn.

The *Political Science Quarterly*, edited by the Faculty of Political Science, has passed through another prosperous year, and has now completed its ninth annual volume.

There were, during the year, ninety-eight applicants for University Fellowships in History and Political Science. Thirty-six of these were found to be of so high a degree of merit as to warrant the Faculty in recommending them for Fellowships; only nine out of the ninety-eight applicants, however, were awarded Fellowships.

I cannot refrain from adding in this connection that the experience of the year now closing has confirmed me in the belief, expressed in my last report, that there should be some increase in the number of University Fellowships. I

am hardly prepared to advocate an increase of Fellowships of the same grade as those already established, but it is clear to me that some plan should be devised for bringing to Columbia at least fifty of the best men who now annually apply for Fellowships, for a year's work in competition for the existing Fellowships. Two great advantages would accrue to the University from the success of such a plan. In the first place, it would enable us to choose the incumbents of the existing Fellowships far more intelligently; and, in the second place, it would secure the attendance of the Fellows at this University for two years in place of one year, without the necessity of re-appointment to the existing Fellowships.

My experience leads me to say that an attendance of two years upon the work of this University is worth about four times as much to the student as an attendance of only one year, and that it is worth far more to the University itself, in that its mark is thereby placed upon the student far more deeply and indelibly than by a single year of attendance. Every student who attains a Doctor's degree must study somewhere for at least two years after having received his Bachelor's degree. If we have him only one year at this University, then he must spend one other year, at least, of his university life at some other university, in which case it would be difficult to say whether he really belonged to Columbia or to that other university. If we would make him wholly our own we must have him in attendance here for at least two years.

There are certainly strong objections to reappointing men to the existing Fellowships; and it is not necessary to double the number of Fellowships of the existing grade to accomplish the purpose in view. Fellowships or Scholarships carrying one half or, perhaps, one third of the privileges and emoluments attached to the existing Fellowships would suffice. I understand that such a plan has been proposed by the President to the Board of Trustees, and I desire to express the cordial approval of the idea involved therein by the Faculty which I have the honor to represent in this report.

Owing to the successful exertions of the President in obtaining contributions of funds for the purchase of books, the different departments in the Faculty of Political Science have been furnished with all current publications and have also been enabled to fill many gaps in their respective literatures. A great deal more, however, is needed to make our material reasonably full and complete upon many subjects. In fact, the steady increase of the library and the development of the University Fellowship and Scholarship system appear to me, and to the Faculty which I represent in this report, to be the most pressing needs of the University, in so far as the work of the Faculty of Political Science is concerned.

Two very important additions have been made to the Faculty of Political Science during the present year, by the appointment of Professor Franklin H. Giddings to the professorship of Sociology, and Dr. A. C. Bernheim to the lectureship upon New York State and City Politics. With these appointments it is expected that the curriculum offered by this Faculty will be considerably extended.

I cannot close this report without expressing to the President of the University, the very keen appreciation felt by my colleagues in the Faculty of Political Science and by myself, of his great generosity in establishing, at his own expense, the department of Sociology in this Faculty. It is a noble foundation, and its liberal outfit by the President places Columbia at once in the foremost rank of the institutions of the country in regard to the subjects embraced within this department. In behalf of all of the members of the Faculty of Political Science, I desire to pledge to the President our most earnest co-operation in the development of the new department to the highest point of usefulness both to the University and to the public at large.

Very respectfully submitted,

JOHN W. BURGESS,
Dean.

June, 1894.

SCHOOL OF PHILOSOPHY

REPORT OF THE DEAN

FOR THE ACADEMIC YEAR ENDING JUNE 30, 1894

*To the President of Columbia College
in the City of New York :*

SIR :

I have the honor to submit herewith the fourth annual report on the work of the University Faculty of Philosophy. This report covers the academic year ending June 30, 1894. The various courses of instruction and research offered by the Faculty, together with a statement of the attendance upon each, are summarized in the accompanying tabular view marked A. A list of the University Fellows appointed in the departments falling under the jurisdiction of this Faculty, together with an outline of the special work of each during the year will be found in the accompanying statement marked B. A list of the recommendations for University degrees made by this Faculty during the year is given in the statement marked C.

During the academic year Professor W. H. Carpenter has been absent on leave, and some of the advanced courses on Germanic philology have, therefore, not been offered.

During the year the Committee on Free and Reduced Tuition granted free tuition in the case of two students for the entire year, and in that of one student for the second session, and reduced by fifty per cent. the tuition fee of a fourth student.

At the meeting of the Faculty on May 11, 1894, Professor Peck, who has been the elected representative of the Faculty

of Philosophy in the University Council since its organization, tendered his resignation, to take effect July 1, 1894, on account of his election to the Secretaryship of the Faculty of Arts, an office which carries with it a seat in the Council. Professor Perry was unanimously elected to fill the unexpired portion of Professor Peck's term as elected delegate.

During the year the number of students pursuing their studies either wholly or in part under the direction of this Faculty has been 165, an increase over the preceding year of 35, or 37.15 per cent. The composition of the list of students is as follows :

1. Candidates for the Degree of Bachelor of Arts :	
Seniors in the School of Arts.....	55
2. Students holding a Bachelor's Degree, or its equivalent, from a foreign institution :	
Men.....	81
Women (registered through Barnard College)...	11
3. Not included in the above.....	18
	<hr/>
Total.....	165

Of the number enrolled, 40 were students in the theological seminaries in this city, admitted in accordance with the resolution passed April 7, 1890. Of this number 30 came from the Union Theological Seminary, 8 from the General Theological Seminary, and 2 from the Jewish Theological Seminary.

The 92 students holding degrees represented the following colleges and universities :

Columbia College.....	28
College of the City of New York.....	10
Harvard University.....	6
Rutgers College.....	4
Bohemian Gymnasia.....	3
Byrn Mawr College.....	3
Hamilton College.....	3
Amherst College.....	2
Beloit College.....	2
Ohio Wesleyan University.....	2
Russian Gymnasia.....	2
Smith College.....	2
Yale University.....	2

Augustana College.....	I
Bishop's College (Canada).....	I
Boston University.....	I
Bowdoin College.....	I
Brown University.....	I
Butler College.....	I
California, University of.....	I
Cincinnati, University of.....	I
Cornell University.....	I
Dalhousie College (N.S.).....	I
Denison University.....	I
Doane College.....	I
Gammon Theological Seminary.....	I
Göttingen, University of.....	I
Hiram College.....	I
Illinois College.....	I
Indiana, University of.....	I
Iowa College.....	I
Lincoln University.....	I
Maine State College.....	I
Maiji Gakuin (Tokio, Japan,).....	I
Michigan, University of.....	I
New Jersey, College of (Princeton).....	I
Ohio Normal University.....	I
Park College (Mo.).....	I
St. Xavier College (Cincinnati, O.).....	I
Stanford University.....	I
Swarthmore College.....	I
Toronto, University of.....	I
Trinity College.....	I
Urmi College (Persia).....	I
Vermont, University of.....	I
Wellesley College.....	I
Wisconsin, University of.....	I
<hr/>	
46 institutions.....	103
Deduct for students holding degrees from more than one institution.....	11
<hr/>	
Total.....	92

The degrees held by the graduate students were as follows :

Bachelor of Arts.....	73
Bachelor of Philosophy.....	2
Bachelor of Science.....	9
Bachelor of Divinity.....	1
Bachelor of Laws.....	1
Bachelor of Letters.....	1

Testimonium Maturitatis.....	6
Master of Arts.....	17
Master of Science.....	3
Doctor of Philosophy.....	1
	<hr/>
Total.....	113
Deduct for students holding more than one degree	21
	<hr/>
Total.....	92
Students without degrees, other than Seniors in the School of Arts,.....	18
Seniors in the School of Arts.....	55
	<hr/>
	165

The number of those who took advantage of the rule admitting auditors to various courses, was 7. Of these, 2 attended courses in Philosophy; 2, courses in Education; 2, courses in German; and 1, courses in Greek.

At the close of the year, 43 candidates for the degree of Bachelor of Arts were certified to the Faculty of Arts as having satisfactorily completed such work as they had undertaken with the Faculty of Philosophy, and 3 as having completed a portion of that work satisfactorily.

The number of courses given during 1893-94 by the several departments represented in this Faculty, as compared with those of the previous year, were as follows:

	Number of Courses.	Increase.	Decrease.
Philosophy and Education..	13	3	—
Greek.....	10	2	—
Latin.....	9	2	—
English.....	13	1	—
Literature.....	4	1	—
Germanic Languages.....	7	—	—
Romance Languages.....	11	4	—
Sanskrit.....	3	1	—
Semitic Languages.....	9	—	2
Iranian Languages.....	5	2	—
Linguistics.....	1	1	—
	<hr/>	<hr/>	<hr/>
Totals.....	85	17	2
		2	
		<hr/>	
Net increase..	15		

The most marked addition to the resources of the Faculty during the year has been the work in Physiological Psychology and Anthropology, under the direction of Dr. Farrand, who entered upon his duties in September last. During the year but a single course of instruction in these subjects has been in progress, because of the fact that the announcement of the work was necessarily made very late ; but for 1894-95 five courses are announced in these subjects, and it is expected that they will be availed of by many students.

In the following table is given a comparative statement of the enrolment under this Faculty since its foundation :

	1890-91.	1891-2.	1892-3.	1893-4.
Total enrolment.....	92	130	130	165
Number holding degrees.....	52	56	62	92
Per cent.....	56.5	43.0	47.7	55.7
Seniors in the School of Arts and students of equivalent standing.....	32	41	58	55
Per cent.....	34.8	31.5	44.6	33.3
Not included in either of the above.....	8	33	10	18
Per cent.....	8.7	25.5	5.7	11

The gratifying features of this table are the large increase in the total enrolment, the steady growth of the number of those who already hold College degrees, and the gain in the number of Seniors in the School of Arts who select courses under this Faculty. The large number of Special students (33) in 1891-92, was due to the fact that the Department of Literature was opened in that year and attracted a large number of students who held no academic degrees, from the various technical and professional schools in the University.

The following table has been prepared to show the relation that the number of Seniors selecting studies under this Faculty has borne to the total number of the Senior class since the year 1890. It will be seen that there has been a gain both in the absolute and in the relative number of

Seniors attracted to the courses in Philosophy, Philology, and Letters:

	1890-91.	1891-2.	1892-3.	1893-4.
Number in Senior Class.....	49	50	71	70
Number electing studies in Philosophy, Philology, and Letters.	32	38	57	55
Per cent.....	65.3	76	80.3	78.6

It is interesting to observe, also, in what way the students enrolled under this Faculty have distributed themselves among the various departments of study. The statistics for the year 1893-94 are as follows:

Department.	Number of seniors enrolled.	Number of graduates and special students enrolled.	Total number of students.	Total enrolment in courses.
Philosophy and Education.....	30	57	87	184
Greek.....	14	23	37	72
Latin... ..	8	15	23	46
English.....	39	18	57	93
Literature....	26	13	39	51
Germanic Languages..	13	18	31	37
Romance Languages..	7	8	15	41
Semitic Languages....	4	14	18	50
Iranian Languages....	1	2	3	11
Sanskrit.....	1	6	7	9
Linguistics.....	2	1	3	6

The difference between the figures that appear in the third and fourth columns of the above table is due to the fact that while the third column specifies the total number of individuals pursuing studies in the departments named, the fourth column specifies the total enrolment in the courses given during the year by each department; and as a single student often takes several courses in one department, the totals in the fourth column are considerably larger than those in the third.

The Department of Romance Languages and Literatures has conducted during the year a course of lectures in French, given on Thursdays at 3.30 P.M., which have been largely attended by students from all departments of the University, as well as by teachers and others. Twenty-four of these lectures were given, chiefly by members of the department, but by special invitation lectures in the course were delivered by M. Émile Levasseur of the Collège de France, M. Raphael Georges-Lévy of the École Libre des Sciences Politiques, and M. Henri Bousquet of the *Journal des Débats*.

The same department celebrated on March 15th the one hundredth anniversary of the birth of Friedrich Diez, who is recognized as the founder of Romance Philology. At this celebration representatives of twenty-one colleges and universities were present, and the exercises reflected great credit upon the department and upon the University.

During the year the Faculty has devoted a great deal of attention to the improvement of the rules and regulations governing the degrees of Master of Arts and Doctor of Philosophy. This subject has been carefully considered by a large and representative committee and has been debated in the Faculty. In general, the action of the Faculty may be said to have had for its purpose the drawing of stricter lines regarding major subjects and the recognition of the fact that the degree of Master of Arts may very properly be taken by a student, after an appropriate period of graduate study, who has neither the desire nor the fitness to proceed to the degree of Doctor of Philosophy.

The list of subjects for the higher degrees, adopted by the Faculty at its meeting on February 9, 1894, and subsequently approved by the University Council, is as follows:

Major subjects: 1. Philosophy; 2. Psychology; 3. Education; 4. Linguistics; 5. Literature; 6. Classical Archæology, including Epigraphy; 7. Greek Language, Literature, and History; 8. Latin Language and Literature, and Roman History; and the following, including in each case the study of both the language and the literature; 9. English; 10. Germanic; 11. Romance; 12. Sanskrit (including Pali) and

Iranian; 13. Semitic; of which Nos. 10, 11, 12, and 13 shall count as the equivalent of a major and one minor subject.

Minor subjects: 1. Philosophy; 2. Psychology; 3. Logic; 4. Education; 5. Anthropology; 6. Linguistics; 7. Literature; 8. Greek Language and Literature; 9. Greek Archæology; 10. Latin Language and Literature; 11. Roman Archæology; 12. Sanskrit; 13. Iranian; 14. English; 15. Anglo-Saxon and Gothic; 16. Germanic Philology; 17. German Language and Literature; 18. Scandinavian; 19. Romance Philology; 20. French Language and Literature; 21. Spanish and Italian Languages and Literatures; 22. Hebrew; 23. Arabic; 24. Assyrian; 25. Syriac; 26. Ethiopic; 27. Semitic Epigraphy.

The action of the Faculty as to the remaining subjects of discussion is contained in the following resolutions which were passed and duly transmitted to the University Council. The action of the University Council upon these resolutions has not yet been reported to the Faculty.

Resolved, That the degree of Master of Arts be given hereafter for one year's graduate study, on the conditions recommended by the Special Committee appointed November 10, 1893, and not for the completion of a portion of the work prescribed for the degree of Doctor of Philosophy.

The conditions recommended by the committee and referred to in the above resolutions are these :

"A distinction should be drawn between the degrees of Master of Arts and Doctor of Philosophy. The latter very properly signifies that a general academic training has been followed by a more or less prolonged period of special study and research in some one field. The former, on the other hand, under our present practice, signifies nothing but that a portion, usually by no means complete in itself, of the work required for the higher degree has been performed. Our first recommendation is, therefore, that the degree of Master of Arts be put upon an independent footing, and that it be granted to such students, already college graduates, as pursue graduate courses of instruction approved

by the committee below recommended, under not fewer than two professors, amounting to not less than eight hours per week for one year, pass satisfactory examinations upon the same, and conform to the present requirement of an essay. For this degree we would abolish the list of subjects entirely, and substitute courses as above stated.

“We recommend that examinations for this degree be in part at least oral, and that these oral examinations be conducted before a standing committee of the Faculty, to consist of seven members, which shall be known as the committee on the Degree of Master of Arts. Favorable recommendation of a candidate by this committee should precede action by the Faculty.”

Resolved, That the list of standing committees of the Faculty be increased by the addition of a Committee on the Degree of Master of Arts, to consist of seven members, in whose presence the oral examinations required for that degree shall be conducted, and on whose recommendation candidates for the degree shall be favorably reported to the University Council.

Resolved, That the list of major and minor subjects for the degree of Doctor of Philosophy, as submitted by the Special Committee appointed November 10, 1893, be approved.

The list of subjects reported by the Special Committee appointed November 10, 1893, is the list as it appears above.

Resolved, That the recommendation of the Special Committee appointed November 10, 1893, as to constituting the professors in charge of the subjects of a candidate for the degree of Doctor of Philosophy, his official advisers, be approved.

The recommendation of the Committee referred to in the above resolution is as follows :

“It has been suggested that certain minor subjects should be required in connection with the several major subjects, by rule of the Faculty. In order to accomplish the desira-

ble end that this suggestion has in view, without unduly limiting the student's choice, we recommend that each candidate be required to select his minor subjects after consultation with the professor in charge of his major subject and with the approval of the latter ; and that when all of the candidate's subjects have been chosen, the professors having them in charge—never to be less than two—shall be the recognized advisers of the candidate, and without their consent, expressed in writing to the Dean, no candidate may make any change in his list of subjects or present himself for examination for the degree."

Resolved, That the University Council be requested to abolish the privilege of obtaining the degree of Master of Arts, in the case of college graduates, on the completion with credit of a professional course of study together with one minor subject for one year under the Faculty of Political Science or the Faculty of Philosophy.

I respectfully renew my urgent recommendations of 1891 as to the arrangement of all courses offered to Seniors in the School of Arts, in specific Examination Groups, and as to the establishment of Docentships in this Faculty ; and that of 1892 as to the establishment of a chair of Geography in this Faculty.

Respectfully submitted,

NICHOLAS MURRAY BUTLER,

Dean.

June 30, 1894.

COURSES OF INSTRUCTION, 1893-94.

116

SCHOOL OF PHILOSOPHY.

Instructor	COURSES	Hours per Week	Students	Auditors	Total number attend- ing
	PHILOSOPHY AND EDUCATION				
	<i>I.—Philosophy, Psychology, and Ethics</i>				
Dr. Hyslop	II. Ethics, introductory course	2	21		21
Dr. Butler	III. General History of Philosophy	2	53	2	55
Dr. Butler	V. Philosophy of Kant and his successors	2	34		34
Dr. Hyslop	VII. Practical and Applied Ethics	2	14		14
Dr. Farrand	IX. Physiological Psychology, introductory course	3	7		7
Prof. Cattell	XIII. Experimental Psychology	2	6		6
Prof. Cattell	XIV. Experimental Psychology, laboratory work	2	1		1
Prof. Cattell	XV. Experimental Psychology: Vision	2	5		5
Prof. Cattell	XVI. Research and individual instruction in Psychology		4		4
Prof. Butler	XVII. Philosophical Seminar	1½	13		13
Dr. Hyslop	XVIII. Ethical Seminar	1	8		8
	<i>II.—Education</i>				
Prof. Butler	II. Principles of Education	1	12	2	14
Prof. Butler	III. Educational Seminar	1	2		2
	GREEK				
Dr. Young	II. Æschylus; Isocrates	2	1		1
Prof. Merriam	III. Lectures on the Greek Drama	1	2		2
Prof. Merriam	IV. Æschylus and Aristophanes; Demosthenes (De Corona)	2	8		8

Prof. Merriam	V. Lectures on the elegiac, iambic, and melic poets	1	8	1	8
Dr. Young	VI. New Testament : Epistles	1	6	1	6
Dr. Young	VII. New Testament : Gospels and Acts	1	8	1	8
Prof. Merriam	VIII. Attic orators	2	6	2	6
Prof. Merriam	VIII. a.	2	3	2	3
Prof. Merriam	IX. Lectures on Greek Art	7	11	3	14
Prof. Merriam	X. Topography, etc.; Pausanias	1	7	1	8
Prof. Merriam	XII. Epigraphy	1	8		8
LATIN					
Prof. Peck	IV. Lucretius	2	4		4
Prof. Peck	V. Petronius	2	6		6
Dr. Egbert	VI. & VIII. Roman History and Historians	3	4		4
Dr. McCrea	VII. Plautus	2	5		5
Dr. Egbert	XI. Epigraphy	1	4		4
Prof. Peck	XII. Horace	2	9		9
Prof. Peck	XV. Gaius	1	9		9
Prof. Peck	XIV. Paleography and Text Criticism	1	4		4
Prof. Peck	XVI. Original Latin Prose Composition	2	1		1
ENGLISH					
Prof. Price	I. Modern English Prose Composition	2	6	2	8
Prof. Price	II. Shakspeare, etc.	2	10	1	11
Prof. Price	III. Chaucer	2	7		7
Prof. Price	IV. Anglo-Saxon prose and historical syntax	2	2		2
Prof. Price	V. Tennyson, Browning, and Arnold	2	2	2	11
Prof. Jackson	VI. Anglo-Saxon and historical English grammar	2	9		4
Prof. Jackson	VII. Anglo-Saxon poetry	2	4		8
Prof. Jackson	VII. a. Anglo-Saxon ; fourth-year course	2	8		1
Prof. Woodberry	X. Spenser	1	1		1
Prof. Woodberry	XI. Milton	1	1		1
Prof. Woodberry	XII. 19th Century Literature	2	3		3

Instructor	COURSES	Hours per week	Students	Auditors	Total number attend- ing
	ENGLISH (<i>Continued</i>)				
Prof. Brander Matthews	XIII. American Literature	2	31		31
Prof. Brander Matthews	XIV. English Versification	1	5		5
	LITERATURE				
Prof. Woodberry	I. History of Criticism	2	16		16
Prof. Brander Matthews	II. Epochs of the Drama	2	10		10
Prof. Brander Matthews	III. History of Fiction	1	22		22
Prof. Woodberry	IV. Practice of Criticism		3		3
	GERMANIC LANGUAGES				
Prof. Boyesen	I. Goethe's Faust	2	13		13
Prof. Boyesen	II. Lectures on German Literature	2	6	2	8
Mr. Babbitt	III. Historical German Prose	2	3		3
Mr. Babbitt	V. Icelandic	2	1		1
Mr. Babbitt	VI. Gothic	2	2		2
Mr. Babbitt	VII. Middle High German	2	2		2
Prof. Boyesen	X. Old Norse Literature	1	8		8
	ROMANCE LANGUAGES				
	<i>French</i>				
Prof. Cohn	II. French Literature in the 17th Century	3	1		1
Prof. Cohn	III. French Literature in the 18th Century	3	6		6
Prof. Cohn	IV. Victor Hugo and the Romantic Movement	1	3	1	4
Prof. Cohn	V. Literary Criticism in France	1	3	1	4
Dr. Woodward	VIII. French Chroniclers of the Middle Ages	1	2		2
Prof. Todd	X. Romances of the Round Table	1	4	2	6
Prof. Todd	XI. Chanson de Roland	1	3		3
Prof. Todd	XII. Introductions to Romance Philology	2	4	2	6

Prof. Cohn Prof. Todd	XV. (a) Seminar : Special Topics in French Literature XV. (b) Seminar : Special Topics in French Philology	1 2	1 3	1 3
Mr. Speranza	<i>Italian</i> IV. Critical Study of the Divina Commedia	2	1	1
Profs. Perry and Jackson Prof. Perry Prof. Perry	SANSKRIT I. Sanskrit, elementary course II. Sanskrit, advanced course III. Pali, elementary course (first half-year only)	2 2 1	6 2 1	6 2 1
Prof. Gottheil Prof. Gottheil Prof. Gottheil Prof. Gottheil Prof. Gottheil Prof. Gottheil Prof. Gottheil Prof. Gottheil Prof. Gottheil	SEMITIC LANGUAGES I. Biblical Hebrew, elementary course II. Biblical Hebrew, advanced course III. Rabbinical Hebrew, Mishna IV. Rabbinical Hebrew, Philosophy V. Semitic Epigraphy VI. Assyrian, first course VII. Arabic, first course IX. Arabic, third course X. Syriac, second course	2 2 1 1 1 2 2 2 2	4 10 2 2 11 5 2 2 7 5	5 10 2 2 11 6 2 7 5
Profs. Perry and Jackson Prof. Jackson Prof. Jackson Prof. Jackson Prof. Jackson	IRANIAN LANGUAGES I. Avesta, first year II. Avesta, advanced course III. Old Persian Inscriptions, first term only IV. Pahlavi, second term only V. Zoroaster and his Teaching	2 1 1 1 1	1 2 3 3 1	1 2 3 3 1
Prof. Jackson	STUDY OF LANGUAGE I. Linguistics	2	6	6

Statement B.

UNIVERSITY FELLOWS, 1893-94.

1. Henry Jagoe Burchell, Jr. . . . Latin
A.B., Columbia College, 1892, and A.M., 1893.
Subjects of investigation: Child Language among the Romans; Comparison of the Styles of Petronius, Suetonius, and Tacitus; Roman Iconography.
Topics for papers or lectures: Pausanias on Olympia; The Latin Alphabet; Latin Pronunciation; Horace and Catullus; Some Portraits of Augustus.
2. Wilfrid Lay Philosophy
A.B., Columbia College, 1893.
Subjects of investigation: Modern German Philosophy, After-Images.
Topics for papers or lectures: Spinoza; Schelling and the Romantic School; Schopenhauer and Modern Pessimism; Inebriate Asylums; Accommodation of the Eye; Perception of Small Differences of Sound; Mental Imagery; Reaction-Time.
3. Allison Emery Drake. . . . Anglo-Saxon
A.B., St. Xavier College, 1886; A.M., Columbia College, 1893.
Subjects of investigation: The Syntactic Influence of Latin upon Anglo-Saxon; The Syntactic Influence of Greek upon Gothic; The Authorship of the West-Saxon Gospels.
4. Arthur Beaman Simonds . . . Romance Languages
A.B., Harvard University, 1891; A.M., University of California, 1893.
Subjects of investigation: Sources of Racine's Tragedies in the Ancient Dramatists; Psychological Mechanism of Racine's Tragedies; Comparison of Racine's *Narcisse* in "Britannicus" with

Iago; Voltaire's Indebtedness to Shakspeare;
The Ideals of Knighthood in the Old French
Romance of "Chretien de Troyes"; Adaptations
from Shakspeare by Ducis.

Topics of papers or lectures: The Life of St.
Alexis; Some Spanish Authors.

5. Selden Lincoln Whitcomb. . . Literature

A.B., Iowa College, 1887; A.M., Columbia College,
1893.

Subject of investigation: Chronological Outlines of
American Literature.

Topic of paper: Nature in Early American Litera-
ture.

6. James Dennison Rogers . . . Greek

A.B., Hamilton College, 1889; A.M., Columbia
College, 1893.

Subject of investigation: Language of the Attic
Inscriptions Prior to 456 B.C., compared with
the Language of Æschylus.

Topic of paper: Comparison of the Style of Lysias
and Isocrates.

7. Caspar Levias . . . Oriental Languages

A.B., Columbia College, 1893.

Subject of investigation: The Aramaic Verb in
the Babylonian Talmud.

Topics of papers: New York City Public Baths;
New York City Department of Charities and
Corrections.

8. Stuart Henry Rowe . . . Education

A.B., Yale University, 1890.

Subjects of investigation: The Psychological
Laboratory at the World's Columbian Exposi-
tion; The Application of Herbart's Doctrines to
Elementary Instruction in Latin and Greek;
Influence of Fatigue on the Attention of Chil-
dren; After-Images.

Topics of papers: Selections from the foregoing;
White's School Management.

Statement C.

RECOMMENDATIONS FOR DEGREES, 1893-94.

1.—Doctor of Philosophy :

1. Charles Sears Baldwin,
A.B., Columbia College, 1888; and A.M., 1889.
Major subject: English Language and Literature.
Minor subjects: Old Norse-Icelandic; Gothic.
Dissertation: An Examination of the Inflections
and Syntax of Fifteenth Century English, as
they appear in the "Morte d'Arthur" of Sir
Thomas Malory.
2. William Julius Eckoff,
Graduate of the Lehrer-Seminar, Hamburg; Pd.D.,
University of the City of New York, 1891.
Major subject: Philosophy.
Minor subjects: Education; Political Philosophy
(under the Faculty of Political Science).
Dissertation: Kant's Inaugural Dissertation of
1770.
3. Joseph Herman Hertz,
A.B., College of the City of New York, 1891.
Major subject: Ethics.
Minor subjects: Philosophy; Education.
Dissertation: The Ethical System of James Mar-
tineau.
4. James Dennison Rogers,
A.B., Hamilton College, 1889; A.M., Columbia
College, 1893.
Major subject: Greek Language and Literature.
Minor subjects: Latin; Greek Archæology and
Epigraphy.
Dissertation: The Language of the Attic Inscrip-
tions Prior to 456 B.C., compared with the Lan-
guage of Æschylus.

5. Norman Wilde,
A.B., Columbia College, 1889; and A.M., 1890.
Major subject: Philosophy.
Minor subjects: Ethics; Latin.
Dissertation: Friedrich Heinrich Jacobi, a Study
in the Origin of German Realism.

2.—Master of Arts:

1. Robert Archibald Ashworth,
A.B., Columbia College, 1892.
Major subject: English Language and Literature.
Minor subjects: Literature; Sociology (under the
Faculty of Political Science).
Essay: The English Novel in the time of Queen
Elizabeth.
2. Ludwig Bernstein,
Testimonium Maturitatis, Gymnasium, Mitau, 1891.
Major subject: German Language and Literature.
Minor subjects: Gothic; Anglo-Saxon.
Essay: Der Parzival des Wolfram von Eschenbach.
3. Olaf Zacharias Cervin,
B.S., Augustana College, 1887.
Major subject: Architecture (under Faculty of
Mines).
Minor subjects: Architecture (under Faculty of
Mines); German.
Essay: A Review of the so-called Colonial Archi-
tecture.
4. Christopher Robert Hamlin,
A.B., Boston University, 1893.
Major subject: Economics and Finance (under
Faculty of Political Science).
Minor subjects: Sociology and Statistics (under
Faculty of Political Science); Education.
Essay: Change in the Relative Value of the
Precious Metals.

5. William Addison Hervey,
A.B., Columbia College, 1893.
Major subject: Scandinavian Languages.
Minor subjects: Gothic; Romance Philology.
Essay: The Ethics of Germanic Paganism.
6. Charles Louis Pollard,
A.B., Columbia College, 1893.
Major subject: Botany (under Faculty of Pure Science).
Minor subjects: Geology (under Faculty of Pure Science); Literature.
Essay: The Genus *Cassia* in North America.
7. Emma Goodeve Sebring,
A.B., Smith College, 1889.
Major subject: Psychology.
Minor subjects: Philosophy; Education.
Essay: The Muscular Sense.
8. Sidney Hubbell Treat,
A.B., Columbia College, 1893.
Major subject: Literature.
Minor subjects: Philosophy; Greek.
Essay: Theocritus.
9. Joseph Center Wight,
A.B., Columbia College, 1892.
Major subject: Historical Jurisprudence (under Faculty of Political Science).
Minor subjects: Constitutional Law (under Faculty of Political Science); Sanskrit.
Essay: Legislation on Marriage and Divorce in the State of New Hampshire.

SCHOOL OF PURE SCIENCE

REPORT OF THE DEAN

FOR THE ACADEMIC YEAR ENDING JUNE 30, 1894

*To the President of Columbia College
in the City of New York :*

SIR :

I have the honor to submit the second annual report from the University Faculty of Pure Science.

In order to bring before you the progress and needs of the Departments, each senior professor has made a detailed report under the following heads: *a.* Instructions; *b.* Equipment; *c.* Researches and Publications; *d.* Expeditions and Surveys—that is, work carried on outside of the laboratories, or in the field; *e.* Suggestions. These reports are uniformly copied and presented to you in full, in addition to the abstracts which are made from them below.

During the past year we have advanced in several directions. The Faculty has been enlarged by the addition of Professor Prudden representing the Department of Bacteriology, and Professor Huntington representing the Department of Human and Comparative Anatomy, both belonging to the School of Medicine, but greatly interested in pure science work. The half-year and full-year courses offered to Seniors and Graduates have increased from 117 in 1893-4 to 161 in 1894-5; the latter figure includes a large number of advanced University lecture courses. The increase has partly been effected by the principle of alternating courses in successive years. The number of candidates for higher degrees, taking their Major courses in Pure Science, has increased from 12 in 1892-3 to 27 in 1893-4. The total

number enrolled in Major and Minor graduate courses last year was 13; the total number enrolled this year was 39. The total number of Seniors and Graduates was 58.

While this increase in attendance is encouraging, two steps are still of pressing importance to raise the number and quality of our students: first, the admission to our Senior courses, from science schools, of qualified candidates for our Bachelor degree; second, the public announcement of the elevation of our Doctor's degree from the two to the three or four years' standard.

The extension of University instruction in science to those not on the University rolls has increased rapidly. As shown in the Departmental reports, 48 public lectures have been delivered in New York and neighboring cities.

In connection with the research work of the Faculty, a valuable step has been taken in systematizing shorter publications into serial contributions from different Departments. Such series have been established for some time in Botany, Geology, Mineralogy, and are now extending to Physiology, Human and Comparative Anatomy, and Biology. Altogether 76 scientific papers have appeared during the year from the different Departments. This is in addition to the following volumes: "Geographical Tables," by Prof. Woodward; "Text-Book of Mineralogy, Crystallography, and Blowpipe Analysis," by Professor Moses; "Lecture Notes in Theoretical Chemistry," by Dr. Wiechmann; "The Ore Deposits of the United States," by Prof. Kemp; "From the Greeks to Darwin," by Prof. Osborn; "*Amphioxus* and the Ancestry of the Vertebrates," by Mr. Willey.

Students.

The number of students attending courses during the first and second years may be summarized as follows:

	1892-3	1893-4
Graduates.....	13	29
Seniors, School of Arts.....	37	29
From School of Law.....	2	
From School of Philosophy.....	1	
Special Students.....	6	9
Total	59	67

The following students were recommended to the University Council for their respective degrees during the year :

For the Degree of Master of Arts.

Herman Stearns Davis, A.B.
Harrison Gray Dyar, B.S.
George H. Ling, A.B.
William Diller Matthew, A.B.
Anna Stockton Pettit, B.S.
Charles Louis Pollard, A.B.
Heinrich Ries, Ph.B.

For the Degree of Doctor of Philosophy.

Harwood Huntington, A.B.
Parker Cairns McIlhiney, Ph.B., A.M.
Edmund Howd Miller, Ph.B., A.M.

REPORTS OF DEPARTMENTS.

DEPARTMENT OF MATHEMATICS.

Professor J. H. VAN AMRINGE.

Six candidates for the degree of Bachelor of Arts elected the course in Differential and Integral Calculus, and, in addition, one such candidate took the same course as an optional. They accomplished Osborne's work on that subject and acquitted themselves with credit.

Five graduate students have pursued courses in this Department during the year. One of these was a candidate for the degree of E.E. in the graduate course of Electrical Engineering in the School of Mines, and one was a graduate of the College of the City of New York and candidate for the degree of M.A. The three others were University Fellows, candidates for the degrees of M.A. and Ph.D. Two of them took Minors in this Department, viz.: Mr. R. A. Millikan, Fellow in Physics, and Mr. H. S. Davis, Fellow in Astronomy. Each of these students delivered a lecture upon an assigned topic connected with the course. Mr. Millikan's subject was "The General Theory of the Transformation of Variables," and Mr. Davis discussed "The

Conditions of Convergency of an Infinite Series." Both discourses were very creditable.

Mr. G. H. Ling, University Fellow in Mathematics, took courses aggregating six hours a week throughout the year. He has, in connection with these courses, and as a part of the required work, delivered frequent lectures upon salient points of the subjects considered. His essay for the degree of M.A., which was given in the form of a lecture, was upon "Point, Line, and Surface Singularities of Uniform Monogenic Functions."

Dr. Fiske, Instructor in Mathematics, has continued his editorial work on the *Bulletin of the New York Mathematical Society*, which now completes its third volume after a most successful year.

COURSES AND ATTENDANCE.

Instructors.	Courses.	Hours per Week.	Students.
	(Number and subject as in Catalogue 1893-4.)		
Mr. Maclay.	X. and XXIII. Projective and Theory of Equations.	2	1 A.B.
Prof. Van Amringe.	XIII. Differential and Integral Calculus.	3	7 A.B.
Prof. Van Amringe and Mr. Maclay.	XIV. Advanced Differential and Integral Calculus.	3	2 Ph.D.
Prof. Van Amringe and Dr. Blake.	XV. General Differential Equations; 1st Term.	3	1 E.E., 2 A.M.
Prof. Van Amringe and Dr. Blake.	XVI. Partial Differential Equations; 2d Term.	3	1 E.E., 1 A.M.
Dr. Fiske.	XVII. Theory of Invariants; 1st Term.	3	1 A.M. and Ph.D.
Dr. Fiske.	XVIII. Theory of Substitutions; 2d Term.	3	1 A.M. and Ph.D.
Dr. Fiske.	XIX. General Theory of Functions; 1st Term.	3	1 A.M. and Ph.D.
Dr. Fiske.	XX. Elliptic Functions; 2d Term.	3	1 A.M. and Ph.D.

The Department has acquired a very interesting and valuable collection of mathematical models, which was purchased from the German University Exhibit at the Chicago Exposition, and presented to the Department by President Low. The collection is illustrative of the Theory of Functions; Analysis Situs; Plane Curves and their Singularities; Surfaces, their Curvature and Singularities; Line Geometry; it will be of great service to the Department.

DEPARTMENT OF MECHANICS.

Professor R. S. WOODWARD.

From the tabular statement it will be seen that the number of students pursuing University courses in the Department was 11; and that the number of those pursuing University and Undergraduate courses with a view to higher degrees was 12.

There was no Fellow assigned to the Department during the year. Those of other Departments pursuing courses in Mechanics have shown commendable zeal and have done good work as students.

The publications and work of investigation of instructors in the Department may be summarized as follows:

By Prof. Woodward: (1) "Recent Experience of the U. S. Coast and Geodetic Survey in the Use of Long Steel Tapes for Measuring Base Lines." Prepared for the International Engineering Congress of the Columbian Exposition, 1894. (*Transactions of American Society of Civil Engineers*, vol. xxx., pp. 81-107.)

(2) "The Iced Bar and Tape Base Apparatus and the Results Obtained with them in the Measurements of Holton and St. Albans Bases." (Part II. of Appendix 8 of Report of U. S. Coast and Geodetic Survey for 1892, pp. 334-489.)

(3) "Geographical Tables." A volume of formulas and numerical tables for the use of astronomers, engineers, ge-

ographers, geodesists, and topographers. Prepared for the Smithsonian Institution. (A volume of about 300 pages now nearly through the press.)

Professor Pupin has been engaged in experimental and theoretical investigations on the flow of alternating currents, especially in conductors possessing attenuating power. These investigations formed two groups: The first were embodied in a paper "On the Resonance Analysis of Alternating and Polyphase Currents," read before the annual meeting of the American Institute of Electrical Engineers, May 19, 1894. The second group related to long-distance telephony, telegraphy, and transmission of electrical power through submarine cables. These investigations were partly experimental and partly theoretical, and the results arrived at seemed to offer a satisfactory solution of some of the old difficulties contained in these problems. A result which deserves especial mention is an application of electrical resonance to multiple telegraphy. It offers a very simple and very reliable method of transmitting a large number of telegraphic messages simultaneously over the same wire.

Professor Pupin published four papers, all relating to modern advances in electricity. He also delivered three public lectures, as follows: upon "Electrical Resonance," upon "Alternating Current Phenomena," and upon "Resonance."

Among the students engaged in advanced work, two had the necessary facilities for original experimental investigation. These were Messrs. Rittenhouse and Rennard, students in the fourth year of the Electrical Engineering Department. The subject of their investigation was: "Analysis of the Rotary Magnetic Field by Electrical Resonance." Both the subject and the method were suggested by Prof. Pupin. The results arrived at were perfectly satisfactory, and settled a long-disputed question concerning the fluctuations of a rotary magnetic field.

COURSES AND ATTENDANCE.

Instructors	Courses	Hours per week	Students
Prof. Woodward	XI. Theory of Potential Function (University)	2	2 Ph.D., 2 B.A. 1 Special
Prof. Pupin	XIV. Maxwell's Theory of Electricity and Magnetism (University)	3	6
Prof. Pupin	IV. Thermodynamics (Collegiate)	3	1 B.A.
Prof. Pupin	VI. and VII. Theory of Dynamo (Collegiate)	3	1 Ph.D. 2 B.A.
Prof. Pupin	VII. Theory of Dynamo (Collegiate)	3	1 Ph.D.

DEPARTMENT OF PHYSICS.

Professor O. N. ROOD.

The total number of students attending in the Department was 317; the number attending in the Laboratory was 301. Laboratory instruction was given by Prof. Hallock, Mr. Cushman, Mr. Gordon, Mr. Parker, Mr. Trowbridge, Mr. Curtis, and Mr. Wade, under the direction of Prof. Rood.

COURSES AND ATTENDANCE.

Courses	Hours per week	Students
II. Sound, Magnetism, Electricity	2 Lec. 4 Lab.	45 B.A. Jun. and Sen.
III. Electricity, Physical Measurements	2 Lec. 4 Lab.	5 B.A. 1 Ph.D.
III. Electricity, Physical Measurements	2 Lec. 2 Lab.	2 B.A. 1 M.A.
IV. Light, Heat	3 Lec. 4 Lab.	6 B.A. 1 Ph.D.

The University Fellow, Mr. H. A. Millikan, M.A., has finished Course III. and several courses in Higher Mathematics and Mechanics, and has completed the special experiments in the Laboratory course for advanced students. He has also made an investigation of "The Polarization of Light from Incandescent Surfaces."

The "John Tyndall Fellow," Mr. Charles R. Mann, A.M., has worked in the laboratories of the university at Berlin, upon "The Conduction of Heat by Micas," and upon a "Telephonic Investigation."

The "Barnard Fellow," Prof. W. L. Robb, A.M., Ph.D., has investigated "The Oscillatory Charge of a Condenser."

The principal publications in the Department are the following:

By Prof. Ogden N. Rood: "On a Photometric Method which is Independent of Color." (*Am. Jour. Sci.*, vol. xlvi., 1893.) "Memoranda of Work Done toward the Absolute Definition of Standards of Color, and Colors in General, under the direction of Prof. O. N. Rood, Chairman of the Committee 'On Color Standards' of the American Metrological Society," by W. Hallock and R. Gordon. (Read by W. Hallock at the meeting in Washington, D. C., April 20, 1894.)

By Prof. W. Hallock: "Supplementary Report on the Deep Well at Wheeling, W. Va." (*Am. Ass. Adv. Sci.*, Madison meeting, 1893.) "A new Method of Constructing a Bolometer." (*N. Y. Acad. Sci.*) "An Attempt to define Color Absolutely." (With Mr. Gordon. *N. Y. Acad. Sci.*) "Preliminary Results of an Investigation on the Photography of Manometric Flames and their Use in the Analysis of Resonance." (With Dr. Floyd Muckey. *N. Y. Acad. Sci.*, May 7, 1894.)

By Mr. R. Gordon: "Railroad Signalling" (*Science*, Sept., 1893. See also the articles with Profs. Rood and Hallock.)

By Mr. H. C. Parker: "A Winter Ascent of Mount Washington." (*Appalachian Club*, Boston, March 7, 1894.)

By Mr. C. C. Trowbridge: "Voluntary Opening of the Distal Extremity of the Bill of *Scolopacidæ*," (Ibis. London Zoöl. Soc., 1894.)

The following public lectures have been delivered: By Prof. Rood: Two University lectures on "Color," to the School of Architecture, S. of M. By Prof. Hallock: Four lectures on "Light," at the Amer. Mus. of Nat. Hist.; also "On the Optics of Lenses" (Brooklyn); "On Earth Temperatures" (Brooklyn); on "Electricity" (Yonkers); "The History of Photography" (Washington); "The Geysers of the Yellowstone Park" (Queens, N. Y.). By Mr. Gordon: Four lectures on "The Atmosphere, Electricity and Magnetism" (Newburg, N. Y.).

During the year many changes have been made in the laboratory in the way of increased apparatus and facilities. Instructions for making each experiment have been written out by Mr. Cushman, and each has been mounted upon a wooden board, and placed with the piece of apparatus. This greatly facilitates the instruction of a large number of students, and furnishes them with the necessary formulæ, references, etc. These are to be collated into a manual of laboratory practice.

The following pieces of apparatus have been donated to the Department: (1) A complete set of apparatus for the determination of molecular weights by the methods of boiling-point and freezing-point, by President Low. (2) A Trowbridge patent log and Trowbridge deep-sea thermometer. (Original samples presented by Mrs. W. P. Trowbridge.) (3) A quarter of a mile of cable-core. (By Mr. Ham, of the Kerite Company.)

Among the pieces of apparatus purchased for the Department during the year, the following deserve especial mention: Two large research spectrometers; a large spectroscope with four prisms; a double micrometer slit spectrophotometer; a penumbra saccharimeter; an Abbey total-refractometer; a Kohlrausch total-reflectometer; a new pattern differential galvanometer, by J. Grunow, after designs by W. Hallock; a reading telescope, by J. Grunow, involving

details of construction; a Weston ammeter; a Weston voltmeter; four d'Arsonval galvanometers; two paraffine condensers; one spherometer with special attachment for determining the errors of a screw; a Jolly balance; a 2000-oz. bullion balance, by Kohlrausch, and set of weights, from 5 kilo. to 0.01 gr.; also many small articles, such as lenses, thermometers, etc.

Messrs. Parker, Trowbridge, Curtis, and Wade have, during the year, constructed many pieces of simple apparatus, such as resistance boxes, Wheatstone bridges, keys, etc.

DEPARTMENT OF CHEMISTRY.

Prof. CHARLES F. CHANDLER.

The Fellow in the Chemical Department was Harwood Huntington, A.B. Trinity 1884. He has been studying for the degree of Doctor of Philosophy. His Major subject was Chemistry, and his Minors were Law (*a*) Contracts, and (*b*) Real Property. Title of Essay: "Certain New Derivatives in the Aromatic Series." Mr. Huntington has been engaged in several investigations in aromatic chemistry.

The essential features of investigations published by instructors of the Department are as follows:

By James S. C. Wells, Ph.D., Instructor in Qualitative Analysis, assisted by Alexander R. Cushman, Ph.D., Assistant in Chemistry: "Notes and Schemes for Qualitative Analysis." (*School of Mines Quarterly*, May, 1894.)

By Ferdinand G. Wiechmann, Ph.D., Instructor in Chemical Philosophy and Chemical Physics: "A Critical Study of Different Methods for the Quantitative Determination of Iron and Aluminium in Bone-Black." (Published in *Science*, June, 1893, New York.) "Lecture Notes in Theoretical Chemistry." (First edition, Wiley & Sons, Sept., 1893, New York.) "Sugar Analysis." (Second revised edition. Wiley & Sons, July, 1893, New York.)

By Edmund Howd Miller, Ph.D., A.M., Assistant in As-saying: "Dissertation on 'Succinimid'," for the degree of Doctor of Philosophy.

By Parker C. McIlhiney, Ph.B., A.M., Honorary Assistant in Assaying: "The Iodine Figure of Rosin." (*Journal of the American Chemical Society*, vol. xvi., p. 56.) Dissertation on "Investigations on Certain Methods of Analysis of Fats and Resins."

Professor Chandler delivered six University or popular lectures upon the "History of Photography," "Aluminium," "Electric Lighting," and the "Chemistry of Photography," in the College and in other parts of the city. Dr. Wiechmann delivered a course of thirteen popular lectures on "Physics," at the Velton School, assisted by Mr. Deghuée. Three lectures were delivered by Mr. Laudy, and one by Dr. Vulté.

Edmund H. Miller, Ph.B., A.M., has been promoted from Assistant in Assaying to Tutor in Analytical Chemistry and Assaying. Marston T. Bogert, A.B., Ph.B., has been appointed Assistant in Organic Chemistry to succeed Delancey W. Ward, Ph.B., resigned.

DEPARTMENT OF MINERALOGY.

Professor THOMAS EGLESTON.

Not including Courses in the School of Mines to candidates for E.M., Met. Eng., C.E., and B.S., which may be taken as Minor subjects for the degrees of A.M. and Ph.D., the courses and attendance have been as follows:

Instructors	Courses	Hours per week	Students	Total
Prof. Moses Mr. Luquer	VIII. Systematic Mineralogy Major Course for Ph.D. Two years	9	2 Ph.D.	2
Mr. Luquer	X. Optical Mineralogy. Major Course for A.M. One year	9		
Prof. Moses	XI. Descriptive and Mathematical Crystallography. Major Course for A.M. One year	9		

The original work completed during the year, and either published or in course of publication, includes the following:

By Professor Moses: (1) *Text-Book of Mineralogy, Crystallography, and Blowpipe Analysis*. This has been designed as a practical handbook for students in Engineering, Chemistry, Geology, etc., in scientific and technical schools, and for use in the field. (2) "A Simplified Method for Obtaining the 'Axial Cross' of any Crystal from any Projection of the Isometric Axis." (3) "Measurements of Crystals of Zincite and Atacanite, and of the Cavities in the Quartz of Upper Montclair, N. J." (4) "An apparently Tetragonal Silver Sulphide."

By Mr. Luquer: (1) "The Optical Recognition and Economic Importance of the Common Minerals Found in Building Stones." This work has been designed as a help to students in the elementary study of optical mineralogy. (2) "The Relative Effects of Frost and the Sulphate of Soda Tests on Building Stones." (3) "The Occurrence of Sodalite in Three New Localities, and its Chemical and Physical Description." (Assistance given by Mr. Volckening.)

The following work has been done by Heinrich Ries, Fellow in Mineralogy: (1) "Study of the Pyroxenes of New York State," including their optical, chemical, and crystallographic properties, mode of occurrence, and manner of formation. The collections of Columbia College, Cornell University, New York State Museum, Rutgers College, and the American Museum of Natural History have furnished valuable and interesting material. (2) "Crystallography of Wollastonite from Diana and Hanisville, N. Y." (3) "Study of Crystals of Artificial Oxide of Zinc." (4) "Chemical and Optical Examination of *Ægirite* from Hamburg, N. J." (5) "Calcites from Missouri."

The Department has added to its facilities a Card Catalogue of articles and works on Mineralogy. It contains now about eight thousand cards, and is being added to as rapidly as time will permit.

DEPARTMENT OF ASTRONOMY.

Professor J. K. REES.

The Fellow in Astronomy, H. S. Davis, will receive his A.M. degree at this coming Commencement. His work during the year in Astronomy has been arduous and successful. Mr. Davis has assisted in our latitude observations, having observed 666 pairs of stars. His essay is upon the "Definitive Declinations of Fifty-six Stars."

COURSES AND ATTENDANCE.

Courses	Hours per week	Students	Total
(Not including courses in School of Mines to candidates for de- gree of C.E.)			
I. General Astronomy	2	1 Sen. A.B.	1
II. Spherical Astronomy	3	3 Sen. A.B.	3
Post-Graduate Work	5	1 Ph.D.	1

The main work of investigation during the past year has been on latitude variation and the constant of aberration. We have so far secured observations on over 2200 pairs of stars. The observers are Rees, Jacoby, Monell, and Davis. In Italy the observers have measured about 2100 pairs. The campaign, as first planned, was to end June 20, 1894, having been begun April 15, 1893. A recent arrangement has been made with M. E. Feryola, Director of the Royal Observatory at Naples, extending the work over the next two years at least. This extension will require observations to be made less frequently than before, but will oblige the observers to give up most of their vacation to the undertaking.

In the coming year also we will carry on our work upon the Rutherford photographs.

During the year papers have been read and published as follows :

By J. K. Rees : "Observations of Aurora of Feb. 23d and March 30th." "Solar Faculæ Shown in Rutherford's Photographs."

By H. Jacoby : "The Motion of 61 Cygni." "Charles Pritchard. Researches in Stellar Parallax." "Some Recent Papers on Astronomical Photography."

By H. Davis : "Note on Bessel's Determination of the Relative Parallaxes of μ and θ Cassiopeæ."

Professor Rees gave a lecture before the N. Y. Academy of Sciences, Section of Astronomy, on "Photographic Charting of the Heavens."

Mr. Jacoby has been absent on account of sickness for most of the second term. His day work has been done by Prof. Rees and Mr. Monell. The night work of Mr. Jacoby was carried on by Prof. Rees and Mr. Davis. Mr. Jacoby has been promoted to an Adjunct Professorship in Astronomy. He assumes his new office July 1st.

During the past year the Department has been most fortunate in securing a course of lectures on Celestial Mechanics by Dr. G. W. Hill. The attendance was large (50) at the first few lectures, but on account of the highly advanced character of the lectures, the attendance fell off to an average of six. Arrangements have been made for another course of lectures by Dr. Hill during the year 1894-5.

During the year a fine reflecting circle, stand, and artificial horizon has been purchased from Wanschaff of Berlin.

DEPARTMENT OF GEOLOGY.

Professor J. F. KEMP.

The Fellow in Geology, W. D. Matthew, has taken his Major in Petrography (Courses VI. and X. below), his Minors in Biology and in Mineralogy. As the first half of his thesis work for Ph.D., he has prepared a description, with map and petrographical determinations, of the Laurentian Plutonic rocks near his home, St. John, N.B. This has been read before the N. Y. Academy of Sciences

and is now in press. Mr. Matthew has also presented one or two minor papers before the Academy, one in particular on his discovery of the antennæ of Trilobites, having attracted wide attention.

COURSES AND ATTENDANCE.

Instructors	Courses	Hours per week	Students
Mr. Hollick	I. General Geology	2 Lect.	1 B.A.
Prof. Kemp	II. General Geology	3 Lect.	2 B.A.
Prof. Kemp	III. Economic Geology	3 Lect.	1 Sp., 1 Ph.D. 1 Ph.D.
P of. Kemp	VI. Advanced Petrography	10	2 Ph.D.
Mr. Hollick	VII. Palæobotany	6	1 Sp., 2 Ph.D.
Prof. Kemp	X. Petrography	12	1 Ph.D.

Professor Kemp has issued a volume on the *Ore Deposits of the United States* (Sept., 1893), and is engaged on a revised edition which will be issued in September, 1894. During June and September, 1893, Professor Kemp was in the field in the Adirondack region, partly with the Summer School in Geology, partly for the State. As a result, a report of 40 or 50 printed pages, and ten township maps on the scale of 1" to the mile, were submitted to the State Geologist, and will be issued in his next annual report. He read a petrographical paper on the Gabbros of the Adirondacks at the Boston meeting of the Geological Society of America, Dec. 28, 1893. He also described the Ore Deposits at Franklin Furnace and Ogdensburgh, N. J., and with Mr. Hollick, the Granite at Mt. Adam and Eve, Warwick, Orange Co., N. Y., and its contact phenomena, from field work of the Summer School of 1892. He also prepared statistical papers for the annual *The Mineral Industry*, and several minor contributions.

Mr. Hollick has continued his work on the Palæobotany of the Cretaceous on Long Island, and the general Geology

of the same district, based on field work in connection with the Summer School in 1893. The papers noted in the list of Departmental Contributions as XIV., XV., and XVIII. have resulted. He has also edited the MSS. of the late Professor Newberry on the "Flora of the Amboy Clays," and the "Flora of the Laramie Group," both of which were in an unfinished and incomplete state, and for the former has arranged for publication by the United States Geological Survey.

Professor Kemp delivered one popular lecture on the Graham Foundation, before the Brooklyn Institute; Mr. Hollick has also lectured before the Geological Section of the same body.

The appropriation of \$300 for the Summer School of Geology has been of indispensable benefit. With it and some private funds Prof. Kemp was in the field in the Adirondacks with four students during June, 1893, and gave the students of the Summer School of Mining a week's instruction in field work.

The Department has given ten excursions on Saturdays and holidays to points of interest in this vicinity.

The Assistant in Geology has been made Curator of the museum, an office of which we have been much in need, and which it is hoped can be made a permanent one.

DEPARTMENT OF BIOLOGY.

Professor HENRY F. OSBORN.

The staff during 1893-4 consisted of Professor Osborn; Professor Wilson; Dr. Dean, Assistant in Vertebrate Zoölogy; Mr. Willey, Assistant in Invertebrate Zoölogy; Mr. Crampton, Laboratory Assistant. Mr. Willey has resigned to accept the Balfour Studentship of the University of Cambridge. Mr. Calkins has been appointed in his place.

The following were in attendance throughout the year upon the various courses of practical and theoretical instruction: One Professor, 2 Doctors of Medicine, 8 Graduates

candidates for higher degrees, (all except one from other institutions, 5 of these pursuing Biology as a major subject); 4 Seniors, B.A., 9 Juniors, B.A., 26 Sophomores, B.S.

Seven out of the eight Collegiate and University lecture courses, announced for the year, were delivered as follows:

COURSES AND ATTENDANCE.

Instructors	Courses	Hours per week	Students	Total
	(Collegiate)			
Profs. Osborn and Wilson	III. General Zoölogy.	4	4 B.A.	
	(University)			
Profs. Osborn, Wilson, and Dean	V. Comparative Morphology	6	6 Ph.D.	6
Prof. Wilson	VI. Comparative Embryology	6	5 Ph.D. ; 2 Spec.	7
Prof. Osborn	VIII. Morphology of the Mammals	6	5 Ph.D.	5
Dr. Dean	IX. Morphology of the Fishes	3	3 Ph.D.	3
Dr. Willey	X. The Protochordata	3	3 Ph.D.	3
Profs. Osborn and Wilson	XI. Advanced Biology Research Course—(Major)	4	4 Ph.D.	4

Thirteen Collegiate and University lecture courses are announced for 1894-5.

Besides the regular instruction, the popular University lecture course was continued upon Fridays of the second term. Prof. Poulton of Oxford University opened the course with three lectures which were very successful, there being altogether 1300 applications for seats. Prof. Osborn continued the course with three lectures. Dr. Frederic Lee (Department of Physiology) was prevented by illness from completing the course.

Several hundred volumes have been added to the Northrop collection of biological works from the Senff Fund. Volumes required immediately have been purchased from a special fund of \$500, donated by a friend. The equipment for instruction has been greatly increased, in fact doubled, by a gift of \$1200 to the laboratory, from a gentleman whose name is withheld. The purchases include skeletons, models, and a beautiful series of charts, besides new apparatus. Mention should also be made of the gift of Mr. Alfred Pell, of a continuous series of the *Journal of the Royal Microscopical Society*.

Professor Osborn has located the fossiliferous seam in the Egypt Coal Mine of North Carolina, and Mr. Matthew, Fellow in Geology, is now exploring it. Prof. Wilson made in 1893 a zoölogical reconnaissance of the Pacific Coast, by invitation of the University of California. This summer (1894) he is studying and collecting for the laboratory at Beaufort, N. C., accompanied by Mr. Crampton. Dr. Dean followed up his successful artificial hatching of the sturgeon (in 1893) on the Delaware, by equal success with the garpike upon the Black River (N. Y.) in 1894. This supplies the laboratory with very rare material for investigation. The Marine Biological Laboratory at Wood's Holl was attended by fourteen Columbia instructors and students in 1893. An equal or larger number will be there this year.

The most important step of the year is the founding of the *Columbia University Biological Series*, four or more volumes, to be published by Macmillan & Co., and to represent the united work of the Department in a series of advanced educational volumes. The second step is the completion of the first volume of the *Studies from the Biological Laboratories of Columbia College*. This is made up of six researches by members of the staff and students since the opening of the Department. It will be published by Ginn & Co., Boston, from the Cushing Press.

Familiarity with foreign work has been kept up by the Morphological Club, meeting weekly, at which abstracts and digests are read. The Biological Section of the N. Y. Acad-

emy of Sciences has had reports of several interesting discoveries. We may mention especially those made by Mr. Strong and Mr. Crampton.

The following is an abstract of the research work: Prof. Osborn completed his address, "Rise of the Mammalia in North America," 55 pages; the article, "Old and New Problems in Evolution," 35 pages, for Merkel u. Bonnet's *Ergebnisse* published in Gottingen; the volume, *From the Greeks to Darwin* 250 pages, No. I. of Univ. Biol. Series; four bulletins from the American Museum.

Prof. Wilson has carried on researches upon the fertilization of the ovum in *Nereis*, and has engaged in experiments upon the isotropy of the egg in the Snail and the Bird (having been aided by Mr. Matthews in the latter case). The results were laid before the Academy of Sciences in a paper, "Experiments on the Horizontal Isotropy of the Egg." This paper will appear in a more extended form hereafter. He has also prepared a paper upon "Homologies and the Recapitulation Theory," and (in conjunction with Prof. Sedgwick) a second edition of the *Text-book on General Biology*, Henry Holt & Co.

During the current year Dr. Dean has published several papers on the structures of little known palæozoic forms, and in addition has been preparing for publication the text and plates of his book on *Fishes, Living and Fossil*: (1) "Ueber die Fortpflanzungsverhältnisse des Störes." (*Allgemeine Fischerei Zeitung*, Munchen, 1893, S. 388-391.) (2) "Contributions to the Morphology of *Cladoselache* (Cladodus)." (*Journal of Morphology*, vol. ix., No. 1, pp. 87-115.) (3) "Recent Experiments in Sturgeon Hatching on the Delaware." (*Trans. N. Y. Acad. of Sci.*, Nov., 1893, pp. 69-74.) (4) "Sturgeon Culture." (*Bull. U. S. F. C.*, of papers read before the International Fisheries Congress in Chicago, No. 36, pp. 35-40.) (5) "A New Cladodont from the Ohio Waverly, *Cladoselache Newberryi*." (*Trans. N. Y. Acad. of Sci.*, Dec., 1893, pp. 115-120.) (6) "The Marine Biological Stations of Europe." (*Wood's Holl Biological Lectures*, vol. ii., pp. 210-234.) (7) "On the Breeding

Habits of the Sturgeon, *Accipenser sturio*." (*Zoölogischer Anzeiger*, Jan., 1894.)

Mr. Willey has given the year mainly to the completion of his volume upon *Amphioxus and the Ancestry of the Vertebrates*. (Col. Univ. Biol. Ser., No. II.)

Mr. Crampton has completed and read one paper: "Reversal of Cleavage in a Sinistral Gasteropod." (N. Y. Acad. of Sci., Feb. 12.) Mr. Strong has completed a memoir of ninety pages upon the "Nervous System of the Amphibia," which will be published in the autumn as his Ph.D. thesis. The illustrations have been prepared at an expense of \$200.

Mr. Matthews of Massachusetts Institute, Fellow in Biology, has been engaged during the greater part of the year in an investigation of the minute structure and functional activity of the pancreas, and the principal results of his work have been laid before the N. Y. Academy of Sciences. His investigation has been based especially on a study of the enormously large pancreatic cells of *Necturus*, but has included also the examination of the pancreas in various stages of activity in a number of other Vertebrates. The results are of much interest.

Mr. Calkins, Tutor-Elect in Biology, has devoted most of his time to an investigation of the Spermatogenesis of *Lumbricus*, and a preliminary paper containing a synopsis of the more important results has appeared in the *Transactions of the N. Y. Academy of Sciences*.

Excellent original work has also been completed by Messrs. Hubbard, Senior, B. A., and Kosmak, Senior, B. A.

Altogether two volumes and twenty-two separate papers have been completed during the past year.

DEPARTMENT OF BOTANY.

Professor N. L. BRITTON.

Mr. John K. Small, Fellow in Botany, in addition to his stated courses of study, has been prosecuting investigations along several lines. He has brought the preparation of his dissertation on "The American Species of *Polygonum*"

nearly to completion. It is planned to print this dissertation in quarto, illustrated by about sixty full-page plates. He has continued his studies of the Flora of the Southeastern United States and the altitudinal distribution of the plants of the Appalachian Mountain System, having spent the greater portion of the summer of 1893 in the field. In connection with these studies he has worked upon plants from Florida and Tennessee, and upon the Mosses of Eastern North America.

COURSES AND ATTENDANCE

Instructors	Courses	Hours per week	Students	Total
Prof. Britton Dr. Curtis	I. Elementary Botany. Major Course. 1 hr. Lecture. 4 hrs. Laboratory	5	1 Sen. A.B. 1 Ph.D. 2 Sp.	4
Prof. Britton Dr. Curtis	II. Elementary Botany. Minor Course. 1 hr. Lecture. 2 hrs. Laboratory	3	3 Sen. A.B. 1 Sp.	4
Prof. Britton	III. General Botany. 1 hr. Lecture	1	1 Sen. A.B.	1
Dr. Curtis	IV. Vegetable Anatomy. 2 hrs. Laboratory	2	1 Sen. A.B. 1 Sp.	2
Prof. Britton	V. Morphology of the Flowering Plants. 4 hrs. Laboratory	4	1 Ph.D.	1
Prof. Britton	VI. Economic Botany. 1 hr. Lecture	1	4 Sen. A.B. 1 4th yr. B.S.	5
Dr. Curtis	VIII. Advanced Vegetable Anatomy. 4 hrs. Laboratory	4	2 Ph.D. 1 A.M.	3
Prof. Britton	IX. The Natural Orders of Flowering Plants. 1 hr. Conference. 4 hrs. Laboratory	5	1 A.M.	1
Prof. Britton	XII. Study of the Flora of a Restricted Area. Research	12	1 Ph.D.	1
Prof. Britton	XIII. Monographic Study of a Genus. Research	12	1 Ph.D.	1

Professor Britton has continued his studies on the Flora of the Northeastern United States, and, in conjunction with Professor H. H. Rusby of the New York College of Pharmacy, done some work on the Flora of Bolivia; he has also in preparation monographs of the genera *Lechea*, *Amelanchier*, and *Cratægus*; some of the results of these studies have been published, and more is nearly ready for publication.

Dr. Thomas Morong was occupied in studies looking towards a monograph of the American species of the genus *Smilax* up to the beginning of his illness in January, 1894. At that time he went to Florida in search of health, but his advanced age prohibited recovery and he died towards the close of April. He had filled the position of Curator of the Herbarium since 1891, and during that time has contributed a great deal of material to the collections, and published many original papers. It will be difficult to find a successor who can fill the post in so satisfactory a manner.

Dr. Carlton C. Curtis has been occupied with a continuation of his studies on the Algæ, and has investigated the composition of the lichen thallus, having succeeded in watching the symbiosis of algal and fungal cells throughout the entire course of the development of the thallus.

Mr. T. H. Kearney, Jr., Special student, has been working on the comparative anatomy of the genus *Butneria*, and on an extensive collection of plants made by Dr. T. A. Wilcox in Arizona.

Mr. Theodore G. White, Fourth-year student in the School of Mines course in Geology and Palæontology, has been studying the American species of the genus *Lathyrus*, and will shortly publish a preliminary paper upon them.

Mr. Charles L. Pollard, Graduate student, has prepared and published a monograph on "The Genus *Cassia* in North America."

Mr. A. A. Heller, Graduate student, who was obliged to leave College during the first term, is now prosecuting his studies in the Flora of Eastern Texas, a region comparatively little known botanically.

The Botanical Library and Herbarium have been continuously used by six specialists. Both have materially increased in size during the year, the Herbarium having been augmented by some 25,000 specimens. Both are greatly crowded in their present quarters, and work with them is prosecuted under difficulty. They have been consulted by many visiting botanists. More commodious but still inadequate quarters have been provided for the botanical laboratory; and its equipment, both in apparatus and material, has been much increased.

Nos. 38-55 of the "Contributions from the Herbarium of Columbia College," aggregating 203 pages and 22 plates, have been published during the year, and a title-page and table of contents issued for Nos. 25-50, forming vol. ii.

DEPARTMENT OF PHYSIOLOGY.

Professor JOHN G. CURTIS.

One candidate for the degree of Ph.D. under the Faculty of Pure Science has pursued, as a Minor, Course III. in Physiology, and in connection therewith has investigated the histological changes in the acting nerve-cell, and the mechanism of secretion.

Investigations have also been carried on and reported under the Faculty of Medicine.

The opportunities for Physiological research have been much increased by the subscription made by the Trustees of Columbia College for an "Investigator's Table," at the Marine Biological Laboratory at Wood's Holl, Mass., for the special use of the Department of Physiology. This Department will thus be enabled to carry on researches at the seaside during the summer of 1894, in the promising field of the Physiology of Marine Types.

The publications of the year comprise the following:

By F. S. Lee: "A Study of the Sense of Equilibrium in Fishes" (I. *Journal of Physiology*, vol. xv.). The same, II.

(In press.) "The Scope of Modern Physiology" (*The American Naturalist*, May and June, 1894).

By P. A. Levene: "Studies upon Phloridzin Glycosuria." (In press.)

By J. S. Meltzer: "The Cardio-Pleurogram and the Nature of Cardio-Pneumatic Movements." (In press.) "Eine luft-dichte Pleuralcanule." (In press.)

In accordance with the suggestions of the committee appointed by the Columbia University Press, arrangements are now being made for the issue of a series of Studies from the Department of Physiology. Each volume will consist of reprints of articles published by the research workers of the laboratory.

The mechanical equipment of the Physiological Laboratory has been increased during 1893-4 by the purchase of a twelve-inch steam lathe to supplement the smaller lathe already in use; and by the replacing of the steam-engine by one of nearly double its power.

DEPARTMENT OF ANATOMY.

Professor GEORGE S. HUNTINGTON.

The Department of Human and Comparative Anatomy has been so recently assigned to the School of Pure Science, that as yet no instruction has been given to students under this Faculty.

The completion and equipment of the Research Laboratory of Animal Morphology, and the successful introduction of the Cold Storage System for the indefinite preservation of fresh anatomical material, enable the Department to offer exceptional advantages both to students electing the regular course now offered, and to advanced workers in morphological research.

Within the last three years the Department has secured collectors in different parts of the world and established connections which at present yield a very abundant and

valuable return of human and comparative anatomical material, both embryonal and mature. The income of this material is sufficiently large and constant to warrant the offering of a considerable portion for research and advanced morphological work.

The Department has been engaged in forming the nucleus of a morphological museum, arranged on the lines of the evolution of animal forms, and designed for reference by individual workers, and for illustration of courses in morphology. Sufficient progress has been made in the direction of mounting the vertebrate material on hand, to render the collection available and useful in the courses now offered. During the past session 619 mounted specimens have been added to the museum, and further accessions are constantly being made. The head of the Department is firmly convinced of the value of this equipment for the advancement of morphological work.

The following papers have been published :

By George S. Huntington: "Morphology of the Biceps Flexor Cubiti, and the Significance of Some of its Variations." (*Annals N. Y. Academy of Sciences*. In press.)

By Dr. F. J. Brockway: "The Tibio-Femoral Articulations of *Elephas Indicus*." (Presented to the Alumni Association of the College of Physicians and Surgeons.)

Dr. Brockway, Alumni Association Fellow in Anatomy, has also carried on an extensive research in the morphology of the mammalian lung, and on the variations in the structure of the humero-scapular articulation in reference to the comparative morphology of the joint.

Dr. L. J. Mason, a special worker in the Research Laboratory, has continued his studies in comparative myology and neurology, dealing with the appendicular muscles and nerves of the genus *Macacus*.

Dr. Young has commenced a study of the comparative myology of plantigrade carnivora and marsupials, and Dr. William B. Noyes has engaged in a research on the arterial circulation of the brain in the human subject.

DEPARTMENT OF BACTERIOLOGY.

Professor MITCHELL T. PRUDDEN.

In the Department of Bacteriology, the investigations of the year have been largely such as concern the relationships of micro-organisms to disease, and the preventive medicine, and are reported upon in detail by the Dean of the Medical Faculty.

COURSES AND ATTENDANCE

Instructors	Courses	Hours per week	Students	Total
Prof. Prudden and Dr. Chees- man	General Bacteriology, Major Course, Laboratory and Reading	30		
	General Bacteriology. Minor Course, Laboratory and Reading	10	2 Graduate	2

These reports from the various departments show that the University is progressing steadily in Science, both in the line of investigation and instruction.

Respectfully submitted,

HENRY FAIRFIELD OSBORN,

Dean.

July 7, 1894.

LIBRARY

REPORT OF THE LIBRARIAN

FOR THE ACADEMIC YEAR ENDING JUNE 30, 1894

*To the President of Columbia College
in the City of New York :*

SIR :

I have the honor to make the following report for the library for the year ending June 30, 1894.

GROWTH OF THE LIBRARY.

The additions for the year were 15,161 bound volumes, of which 5017 were received from purchase or by exchange, and 10,144 by gift or from purchase out of sums of money given for the purpose. During the year, 711 different persons or institutions have presented books or pamphlets to the library; the number of volumes given to the library was 6504; the number of pamphlets given was 2187.

The additions to the library for the past five years, from July 1, 1889, to June 30, 1894, were as follows :

1889-1890	14,125
1890-1891	16,440
1891-1892	15,408
1892-1893	19,797
1893-1894	15,161
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amounting for the five years to	80,931

The additions for the five previous years, from July 1, 1884, to June 30, 1889, were as follows :

1884-1885	7,256
1885-1886	6,560
1886-1887	7,711
1887-1888	5,807
1888-1889	8,502
<hr/>	
amounting for the five years to	35,836

or an increase in the rate of growth of the library for the second period over the first period in round numbers of 125 per cent. It is probable that the rate of increase for the period from 1884-1889 over that of the previous five years would be found to be still larger than the very great advance made during the past five-year period since 1889.

The inference which is obvious from this comparison is that we may naturally look in the future for a still more rapid growth of the library. The additions for the past year fall off somewhat from those of the year 1892-1893, partly by reason of a reduced appropriation from the general treasury for the purchase of books, and partly because the amount available from other sources for the purchase of books was, until late in the fiscal year, small.

The important gifts of money for the purchase of books to be mentioned later, which were received in the latter part of the year, have been expended only to a limited extent, the larger part of the orders already placed against these gifts having not yet come in. The reduced appropriation from the general treasury being little more than sufficient to cover what may be termed the fixed charges of the library, for the payment for subscriptions to periodicals and continued works, together with current binding and repairs, but little money was available for the purchase of books in the several departments.

The general impression, left by the work of the year in the development of the library for the University, is one of an increasingly broad and lofty ideal of what the library

of Columbia College should be, and of ever widening demands on it for material for scientific work in the several departments of study. The conception of a library ample in its resources in every field of science pursued in the University, and as complete for practical purposes as it is possible to make it, is every year becoming more familiar, and appearing more essentially necessary to the minds of the teaching body throughout the whole institution. An analysis of the growth of the library in the several departments of science for the past five years would show that, on the whole, where the broadest and freest ideas have prevailed regarding the true scope and character of a University library, and where it has been possible to go forward with the greatest freedom and method in the acquisition of books, the greatest development of the library has been attained.

Efforts have been made during the past year, as heretofore, to gather as far as possible the important sets of books and periodicals and transactions, and those larger works which often contain hundreds of smaller works and special articles, frequently recommended singly for purchase by officers of instruction. Many persons recommending books for purchase to the library realize the importance of the acquisition of complete series or works, instead of the fragment which might contain what was needed for a single occasion.

LIBRARY BUILDING.

No changes or additions have been made within the library building during the past year. The storage capacity of the several rooms of the library is already practically exhausted, and it will be with the greatest difficulty that the many thousands of volumes to be expected within the coming year can be shelved. With the prospect of a new library building before us in the immediate future, just what policy will be wisest for the storage of the books received while the library occupies the present building is a matter of question.

USE OF THE LIBRARY.

The number of books loaned from the library for use at home was 42,015. An extension of time was asked on 19,834 of these loans. This is a very marked and gratifying increase over the previous year.

The record of loans for the past five years, from July 1, 1889, to June 30, 1894, is as follows :

1889-1890	16,004
1890-1891	22,721
1891-1892	26,632
1892-1893	28,184
1893-1894	42,015

amounting for the five years to	135,556
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The record for the previous period of five years from July 1, 1884, to June 30, 1889, is as follows :

1884-1885	7,219
1885-1886	6,696
1886-1887	13,373
1887-1888	12,615
1888-1889	11,325

amounting for the five years to	51,228
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It appears then that the increase for the period of five years just ended over that of the previous five-year period is nearly 165 per cent. It is gratifying to note thus that the rate of increase of the use of the library as indicated by books loaned from the building has more than kept pace with the very great increase in the number of books added to the library.

CATALOGUE DEPARTMENT.

The work accomplished by the catalogue department has been substantially the same as that of last year. The number of new cards written and placed in the catalogue was 52,418. Corrections and additions were made on 18,868

old cards during the year. The number of new cards placed in the catalogue during the past five years was as follows :

1889-1890	19,254
1890-1891	26,847
1891-1892	39,903
1892-1893	50,373
1893-1894	52,418

amounting for the five years to	188,795
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or a yearly average of 37,759. The average for the three preceding years from July 1, 1886, to June 30, 1889, the only early years for which reliable records are at hand, was 15,634. It will thus be seen that the amount of cataloguing work done has more than tripled during the past five years having risen from about 15,000 entries annually to over 50,000.

The number of persons employed was reduced somewhat at the beginning of the year for lack of funds. While the work of the catalogue department has not on the whole fallen in arrears, and much satisfactory work has been accomplished in many directions, the present and prospective increase in the extent and scope of the library makes necessary, in my judgment, a certain increase in the cataloguing force.

It becomes increasingly evident to me that money expended for judicious and accurate catalogue work in a great library is most wisely invested. A great library receiving in large part the current production of scientific research in all departments of learning as expressed in periodicals and transactions of learned societies as well as books and monographs requires the fullest practicable means in the shape of catalogues, indexes, and other guides to its contents, in order to make them in any adequate degree available for use.

Work has also been carried on as opportunity afforded in making such changes in the arrangement and classification of books in the library as would render them of the greatest service for the work of the University. The governing

principles which influence these changes are, first : the attainment of as much simplicity and definiteness in the classification as possible ; and second : the arrangement in one body as far as practicable of all books and classes of books required for each department of study in the University. An arrangement of books on the shelves bringing together in one group the material required for each general branch of study will give to the officers and special students in that department all the advantage of a special library arranged for their needs, while over against every other department such a body of books will form part of a general library convenient for use. When in the future library building it shall be possible to provide near to these several classes of books, reading-room space for officers and special students, the highest development of the modern library will have been reached.

Looking forward to the time when such space will be available, it seems proper, as far as convenient, so to arrange the rapidly multiplying books of the library that they will take their place in the new library building without a long-continued period of greater or less confusion.

Work on pamphlets of the description indicated last year has been carried on as far as time would permit during the past year.

GIFTS.

The current of small and miscellaneous gifts of books and pamphlets to the library is constant and increasing. Gifts of money for the purchase of books have been received as follows :

Samuel P. Avery.....	\$10,284 69
H. T. Imbrie.....	250 00
Wm. Ziegler.....	1,000 00
Anonymous.....	20,000 00
W. C. Schermerhorn.....	5,000 00
A. C. Bernheim.....	100 00
F. A. Schermerhorn.....	500 00
Henry Adams.....	1,000 00

The gift of Mr. Imbrie, made through Prof. Butler, was for the purchase of books in Philosophy. The gift of \$20,000.00 was a sum placed in the hands of the President by a gentleman who wished his name to remain unknown, which was by the President devoted to the purchase of books for the library, to meet the needs which had been loudly expressed from many sources during the earlier part of the year. Of this sum of \$20,000.00 it was determined by the President to set apart one half, or \$10,000.00, to begin work on a plan of a comprehensive library of Jurisprudence which had for some time been under consideration. \$5,000.00 of this amount was devoted to private law, and the same sum to public law.

As the library already possesses large collections in both these fields, this sum will contribute largely toward the carrying out of the proposed plan. The body of legal literature is, however, a very large one, and it is hoped and expected that when the sum at present available is expended other means will be forthcoming. The remainder of this gift was divided, in the main, between the several departments where the needs seemed greatest.

The gift of \$5,000.00 by Mr. W. C. Schermerhorn is for the purchase of books on Sociology. The library already contains excellent collections in many departments of this important field, but this sum will enable us to enrich ourselves in many directions and fill many pressing needs. It would seem highly proper and desirable that this library should possess, for the furtherance of the work in this field of ever growing importance, as rich and full a collection as it is possible to bring together.

From a sum of money given by Mr. F. A. Schermerhorn, some time ago, and lying in the hands of the Treasurer, at the disposal of the President, there was set apart for the library for the purchase of books in Zoölogy the sum of \$500.00.

Mr. Henry Adams, who received this year the first Loubat prize of \$1,000.00 for his history of the United States, nine volumes, generously presented that money to

the College for the purchase of books on American History for the library.

An important gift, received during the year, was that made by President Low, of eighteen immense albums, containing drawings, plans, designs, and views of the German universities. This collection was made by the German Government, and exhibited at the World's Fair in Chicago, where it attracted much attention among educators. It was purchased, among other educational material, by President Low, and presented to the library. Substantial and carefully constructed cases to contain these immense volumes have been made at the expense of the President. These volumes contain an absolutely unique and unrivalled body of material for the study of the architecture, arrangement, and construction of the German universities and of the various laboratories, hospitals, clinics, and other institutions connected with them.

This forms an interesting addition to the already unequalled resources of the library in these fields as contained in the Avery Library.

Gen. J. Watts de Peyster has given the library two valuable marble busts of Washington, one by Crawford and the other by Greenough, famous American sculptors. He has also given a bronze relief medallion portrait of Gen. Phil. Kearny, a graduate of Columbia of the class of 1833, and a miniature reproduction in bronze of the statue of Lincoln recently erected in Edinburgh. He has also given, during the year, a considerable collection of books relating chiefly to the period of the Thirty Years' War.

Miss Cornelia Prime has given a valuable marble bust of Machiavelli, by Crawford, with a marble pedestal.

The family of the late Prof. J. S. Newberry have given his library to the College, to be known as the Newberry Library of Geology. Much of this collection duplicates the works in the general library, and will be kept as a departmental library. Work on this collection has, as yet, only in small part been done.

AVERY ARCHITECTURAL LIBRARY.

Mr. Avery has authorized and paid for very considerable additions to the Avery Library, which have been made during the past year, while his own gifts of books have, as usual, been constant. There have been added to this collection during the past year 3400 volumes, and the collection now contains about 12,000 volumes. It has so largely outgrown the space available for its storage and use, that, if any further accommodation can possibly be found for it in this building, enabling its vast resources to be more fully utilized by students and investigators, it would seem highly necessary to take steps to accomplish this.

This collection, while more full in architecture than in any other field, as is natural from its original conception, is in large measure an art library. An article describing it somewhat in detail was published in the *Columbia Literary Monthly* for January 1894. Mr. Avery has caused to be put up during the past year a bronze tablet made by Chaplin, of Paris, in memory of his son, in commemoration of whom this collection was founded. It consists of a sitting figure of architecture with a medallion portrait of Mr. H. O. Avery in low relief. This has been placed, for the time being, in the general reading-room. Work on the catalogue of the Avery Library has been carried on unremittingly and about four hundred pages of it have been printed at the De Vinne Press.

The Avery collection is in its field sufficiently rich and complete to deserve and gain when better known a world-wide reputation. While it may not be possible in the wholly inadequate place in which it is at present necessarily kept for the Avery Library to attain anything like its full use and value, it cannot fail to be of the greatest service in all the future of the library.

EXPENDITURES.

The direct expenses of the library paid here were as follows:

Salaries, expended.....	\$19,499.73
Supplies and Incidentals.....	1,200.00
Books and Binding.....	11,344.89

The Book Account was as follows :

Bal. from last year...	\$732.42	Expended for books	
Appropriation.....	9,000.00	and binding.....	\$11,344.89
Sales	57.86	Balance carried over	
Fines	218.30	to next year's ac-	
Gifts	1,850.00	count to meet out-	
		standing orders..	513.69
	<u>\$11,858.58</u>		<u>\$11,858.58</u>

This statement of expenditure for books and binding does not include books brought with either the Senff Funds or the recently given Special Fund of \$20,000.00, the Schermerhorn sum for Sociology of \$5,000.00, or the Adams Fund of \$1,000.00 for American History, all of which are paid directly from the Treasurer's office.

There was expended for binding and repair of books in the general library the sum of \$2,991.99, which does not include books bound abroad or for the Avery Library. The number of books newly bound was 2246, including 162 volumes bound for the New York Academy of Sciences, at a cost of \$167.05.

1174 volumes were rebound or repaired at a cost of \$459.28.

By resolution of the Trustees the products of any sales of duplicates from the Struve Library are devoted to the binding of books received in that library, of which many are still unbound. There have been received to the present time from sales of Struve duplicates \$156.70 and books have been bound to the cost of \$151.24, leaving a balance of \$5.46 still unexpended.

Class and book numbers were gilded on 22,678 volumes at a cost of \$642.89.

Appendices show the current use of the library and give the names of persons and institutions who have given, during the year, books and pamphlets to the library.

Respectfully,

GEO. H. BAKER.

Librarian.

June 30, 1894.

APPENDIX A.

STATISTICS OF THE USE OF THE LIBRARY, 1893-'94.

1893-'94.	Days Open.	Loans.	Renewals.	Total Loans.	Daily Average.	Largest Loaned.	Smallest Loaned.	Fines.	Readers' Tickets Issued.
July	25	1758	555	2313	92.5	101	30	\$ 7.20	1
August	27	1376	729	2105	78.0	114	24	6.65	1
September	26	2280	784	3064	117.8	145	55	16.55	12
October	25	3699	3244	6943	277.7	242	75	17.30	21
November	25	3896	630	4526	181.—	248	86	32.80	22
December	23	3304	1845	5149	223.8	242	64	17.20	12
January	27	4912	2042	6954	257.6	282	30	25.30	22
February	24	3816	1050	4866	202.8	201	88	22.75	19
March	26	4711	2918	7629	293.5	368	84	17.60	12
April	25	4168	1103	5271	210.8	198	110	15.20	9
May	27	4940	1271	6211	230.0	208	124	22.00	4
June	25	3155	3663	6818	272.7	268	52	17.75	8
Totals	305	42,015	19,834	61,849	202.8	—	—	\$218.30	143

APPENDIX B.

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Adelbert College		13	Augustana College		1
Adrian College		1	Australasian Assoc.	1	
Aguilar Free Lib.		1	Avery, S. P.	3,414	
Ala. Adj.-Gen.		1	Bailey Reflector Co.		2
" Auditor		2	Baker, W. G.	15	
" Bar Assoc.		6	Ballarat Sch. of Mines		1
" Geol. Survey		2	Balt. School Com.		2
" Treas.		1	" Woman's Coll.		1
Albany Common Counc.	5		Bangor Pub. Lib.		1
" Law School		2	Bartholomae & Co.		1
" P. E. Church		2	Bay City Indust. Works		2
Albion College		1	Beach, Charles F., Jr.		1
Allen, Dr. F. F.	1		Beck, F. & Co.		4
Allis, E. P. Co.		4	Beloit College		1
Am. Bankers' Assoc.		1	Bergbohm, J.		1
" Book Co.	32		Berlin Iron Bridge Co.		2
" Druggist	1		Bernheim, A. C.	33	
" Ephemeris	1		Beutenmeuler, W.		1
" Hist. Assoc.	2		Biddle, Mrs. Geo.	105	
" Humane Educ. Soc.		2	Bindley Hardware Co.		1
" Metrological Soc.	12	22	Bingham Co.		1
" Museum of Nat. Hist.		2	Bischoff Steel Ceiling Co.		1
" Peace Soc.		1	Boardman, Geo. D.		1
" Philosophical Soc.	2		Bodio, L.	7	
" Protec. Tariff League		78	Bonham, J. W.		2
" Psychological Assoc.		1	Boston Assoc. Charities		1
" Soc. of Mechan. Eng.	1		" Auditor	1	
" Soc. Prevention Cruelty to Children		1	" Children's Aid Soc.		1
" Screw Co.	1		" Children's Hospital		1
Amherst College	1	2	" Museum Fine Arts		1
Andover Theol. Sem.		1	" Normal School		1
Andrews, W. L.	1		" Public Library		4
Anthony's Phot. Bull.	1		Also 26 cases of Pamphlets and Repts.		
Ark. P. E. Diocese		1	" Terra-Cotta Co.		1
" Sec. of State	1		" University		1
" Supt. Pub. Instr.	1		Bowdoin College		2
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Assoc. of Engin. Soc.	1		Bradstreets	1	

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Britton, N. L.	108	28	Dept.	1	
Broderick & Bascom . .		1	" Sunset Club . .	2	
Brooklyn Civ. Ser. As-			" Theol. Sem. . .		1
soc.		1	" Trade Bd. . .	1	
" Educ. Bd.		2	" University . .		2
" Eye and Ear			Child, G. W.		1
Hospital		1	Cilley, J. P.	1	
" Library		2	Cincinnati Corrugating		
" New Engl.			Co.		2
Soc.		2	" Pub. Lib. . .		2
" Soc. Preven-			" University . .		1
tion of Cruel-			Clafin University . .		1
ty to Children		1	Clark, Burnett, & Co. .		3
Brown, G. M.		1	Clark University . .		1
Brown University . .		1	Cleveland Educ. Bd. .		1
Buffalo Charity Organi-			Colby, C. E.	9	29
zation Soc.		1	Colby, T. C.	9	
" Hist. Soc.		1	Colby University . .	1	5
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Butler, N. M.	230	166	Cross		1
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" Equalization			Collins, J. H.		1
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" Insurance			" University . .		1
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reau	2	1	" Seminar . .	33	
" Surveyor Gen.	4	3	" Polit. Sci.		
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Carter, H. C.	3		Cornell University . .	1	5
Centre College		1	Cotgreave, A.		1
Cesnola, L. P. de	1		Counsel, E.		1
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" State Dept. . .	2	3	" Univ. Bibliotheks		4
" Surgeon Gen. . .	1		Wigan Free Pub. Lib.		1
" Treas. Dept. . .	5	4	Willamette Univ. . .		1
" War Dept. . . .	20		Williams College . .		2
University of the Pacific		1	Williston Seminary . .		1
Ursinus College . .		1	Winslow Bros. . . .	2	2
Van Amringe, J. . .	2		Wisc. Acad. of Sci. . .	2	
Vandegrift, F. B. . .		2	" Health Bd. . . .	1	
Vanderbilt Univ. . .		2	" Hist. Soc. . . .		1
Van Iderstine . . .		16	" University		4
Vassar College . . .		1	Wittenberg Coll. . .		1
Vassar Bros. Inst. . .		2	Wooster Univ. . . .		1
Vermont Agric. Ex.			Worcester Acad. . .		1
Station		1	" Free Pub. Lib.		1
" P. E. Diocese . .		1	" School Supt, . .		1
" St. Lib.	18	6	Yale College	1	4
Vinton, A. D. . . .	1		Yankton College . .		1
Virginia Univ. . . .		4	Young, J. F.	1	
Warner, J. De Witt .	33	10	Giver Unknown . . .	30	204
Warren, Fuller, & Co. .	2				
Waterbury Poor Com.		1		6,504	2,187

TREASURER'S REPORT OF RECEIPTS AND
DISBURSEMENTS FOR THE YEAR
ENDING JUNE 30, 1894

RECEIPTS.

Receipts from—

Rents.....	\$386,276 14
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Fees :

Examination Fees.....	305 00	
Matriculation Fees.....	3,655 00	
Tuition Fees.....	263,956 38	
Diploma Fees.....	8,690 00	
		276,606 38

Students :

For Breakage, Supplies, and Ma- terial.....	7,772 19
--	----------

Sundries :

Interest on Investments.....	32,354 15	
Interest from Trust Companies..	3,531 05	
Interest on Rents.....	460 48	
Arrears of Rent.....	7,656 50	
Library—Fines, and Sales of Duplicates.....	276 16	
Lectures.....	195 00	
Sale of Catalogues.....	57 25	
Sale of History of College of Physicians and Surgeons.....	2 00	
		44,532 59

Carried forward.....	\$715,187 30
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Brought forward.....			\$715,187 30
Funds Provided by Gift :			
For Public Lectures.....	250 00		
“ Sundry Purposes.....	10,000 00		
“ Prizes, and the like.....	1,633 34		
For Library :			
“ Specials.....	2,489 47		
“ Avery Architec- tural Library..	10,284 69		
“ Adams Collection in History....	64 90		
“ Senff Collection in Biology....	1,225 18		
“ Senff Collection in History....	3,981 73	18,045 97	
			29,929 31
Advance on Account of Interest on Barnard Fund for the Increase of the Library.....			1,401 58
Payments Met by Bonds Issued in 1892-93 for Construction of the 60th Street Addition to College of Physicians and Surgeons :			
For Construction.....	1,005 00		
“ Electric Lighting.....	112 43	1,117 43	
			\$747,635 62

DISBURSEMENTS.

Business Administration :			
Salaries.....	9,450 00		
Expenses of Estate :			
Interest Payable.....	3,493 05		
Insurance.....	50 00		
Office Rent.....	1,100 00		
Contingent Expenses of Treas- urer's Office	2,001 30		
Contingent Expenses of the Clerk's Office.....	699 38		
Taxes, Insurance, Repairs, etc., for the Wheelock Property....	1,207 32		
Carried forward.....		\$18,001 05	

Brought forward.....		\$18,001 05
Educational Administration :		
Salaries.....	28,932 77	
General Administration :		
Printing.....	5,999 97	
Printing and Distributing the President's Report....	1,249 95	
Advertising.....	1,714 67	
Bulletin.....	749 18	
New Edition of General Cata- logue.....	500 00	
Chicago Columbian Exposition..	2,497 21	
Peithologian Society.....	16 00	
Philolexian Society.....	97 76	
Lectures.....	2,638 38	
Commencement.....	1,115 96	
Baccalaureate.....	55 10	
President's Emergency Fund...	950 99	
Encouragement of Rowing	1,292 05	
Gymnastic Exercises, Including Athletic Grounds.....	5,800 00	
Bureau of Supplies.....	6,041 59	
Barnard Medal.....	650 00	
Drisler Minute.....	935 40	
Hamilton Fish's Portrait.....	1,054 00	
	<hr/>	62,290 98
Payments Account of Buildings and Grounds at 49th Street :		
Wages, Boiler House and Jani- torial Service.....	20,969 67	
Repairs, Furniture and Fixtures	6,968 51	
Gas and Electricity.....	5,042 43	
Fuel.....	4,966 02	
Cleaning.....	1,158 41	
Superintendent's Supplies.....	2,972 59	
Water Rates.....	773 15	
Library Shelving.....	75 00	
Uniforms	353 85	
Rent of Two Buildings....	3,516 96	
	<hr/>	
Carried forward.....	\$46,796 59	\$80,292 03

Brought forward.....	\$46,796 59	\$80,292 03
Mortuary Chapel and Barnard Memorial.....	2,094 88	
	<hr/>	48,891 47
Chapel :		
Salaries.....		1,800 00
Emeritus Officers :		
Salaries.....		525 00
Fellowships.....		15,731 66
Scholarships.....		2,235 68
Prizes :		
Chanler Historical Prize.....	60 00	
James Gordon Bennett Prize.....	50 00	
Joseph F. Loubat Prizes.....	1,400 00	
Robert N. Toppan Prize.....	150 00	
Law School Prizes.....	500 00	
	<hr/>	2,160 00
Library :		
Salaries.....	24,499 73	
Books, and Binding of.....	11,363 39	
Incidentals and Supplies.....	1,200 00	
Avery Architectural Collection....	10,933 95	
F. A. P. Barnard Collection	29 54	
Senff Collection in Biology.....	1,225 18	
Senff Collection in History.....	3,981 73	
Special Fund.....	1,489 47	
Adams Historical Collection.....	64 90	
	<hr/>	54,787 89
Department of Architecture :		
Salaries.....	20,500 00	
Departmental Appropriation.....	1,999 83	
	<hr/>	22,499 83
Department of Astronomy :		
Salaries.....	7,900 00	
Departmental Appropriations :		
For Astronomy and Geodesy...	380 84	
" Observatory for Apparatus..	29 12	
" Geodesy for Instruments...	168 65	
" Summer Class in Geodesy..	800 00	
	<hr/>	9,278 61
Carried forward.....		<hr/> \$238,202 17

Brought forward.....		\$238,202 17	
Department of Biology :			
Salaries.....	10,400 00		
Departmental Appropriation.....	1,480 54		
Table in Marine Biological Laboratory, Wood's Holl.....	100 00		
			11,980 54
Department of Botany :			
Salaries.....	5,125 00		
Departmental Appropriation.....	599 34		
			5,724 34
Department of Chemistry :			
Salaries.....	24,550 00		
Departmental Appropriation.....	11,886 78		
			36,436 78
<i>Engineering.</i>			
Department of Civil Engineering :			
Salaries.....	9,100 00		
Departmental Appropriations :			
For Civil Engineering,	34 03		
For Summer School in Surveying.....	1,934 37		
For Tents, Improvements at Farm, etc.	243 45		
For Rent of Farm...	150 00		
For New Instruments for Summer School in Surveying.....	3,261 08		
For Repairs to Instruments for Summer School in Surveying	500 00		
		15,222 93	
Department of Electrical Engineering :			
Salaries.....	5,200 00		
Departmental Appropriation.....	998 52		
		6,198 52	
Carried forward...		\$21,421 45	\$292,343 83

Brought forward.....	\$21,421 45	\$292,343 83
Department of Mechanical Engineering:		
Salaries.....	9,537 50	
Departmental Appropriations:		
For Mechanical Engineering.....	249 51	
For Drawing.....	299 71	
For Mechanical Laboratory and Summer School.....	737 00	
	<u>10,823 72</u>	
		32,245 17
<i>English.</i>		
Department of the English Language and Literature:		
Salaries.....	10,000 00	
Departmental Appropriation.....	2 93	
	<u>10,002 93</u>	
Department of Literature:		
Salaries.....	9,000 00	
Departmental Appropriation.....	10 25	
	<u>9,010 25</u>	
Department of Rhetoric:		
Salaries.....	9,200 00	
	<u>28,213 18</u>	
Department of Experimental Psychology:		
Salaries.....	2,500 00	
Departmental Appropriation.....	490 00	
	<u>2,990 00</u>	
Department of Geology and Palæontology:		
Salaries.....	5,500 00	
Departmental Appropriation.....	497 78	
Summer School in Geology.....	400 00	
	<u>6,397 78</u>	
Carried forward.....		\$362,189 96

Brought forward.....		\$362,189 96
Department of the Germanic Languages and Literatures :		
Salaries.....		10,800 00
Department of Greek :		
Salaries.....	16,700 00	
Departmental Appropriation.....	186 19	
	<hr/>	16,886 19
Department of Hygiene and Sanitary Science :		
Salaries.....	2,000 00	
Departmental Appropriation.....	627 99	
	<hr/>	2,627 99
Department of Latin :		
Salaries.....	8,700 00	
Departmental Appropriation.....	39 14	
	<hr/>	8,739 1
Department of Mathematics :		
Salaries	15,000 00	
Departmental Appropriation.....	48 67	
	<hr/>	15,048 67
Department of Mechanics :		
Salaries	8,800 00	
Departmental Appropriation.....	34 75	
	<hr/>	8,834 75
Department of Mineralogy and Metallurgy :		
Salaries	13,800 00	
Departmental Appropriation.....	999 93	
	<hr/>	14,799 93
Department of Mining :		
Salaries	8,075 00	
Departmental Appropriations :		
For Mining.....	499 32	
“ Summer Class in Mining...	1,000 00	
	<hr/>	9,574 32
Department of Philosophy, Ethics and Psychology :		
Salaries	8,400 00	
Departmental Appropriation.....	330 35	
	<hr/>	8,730 35
Carried forward.....		<hr/> \$458,231 30

Brought forward.....		\$458,231 30
Department of Physics :		
Salaries	16,200 00	
Departmental Appropriation....	1,499 88	
	<hr/>	17,699 88
Department of Rabbinical Lan- guages and Literature :		
Salaries	3,000 00	
Departmental Appropriation....	71 00	
	<hr/>	3,071 00
Department of the Romance Lan- guages and Literatures :		
Salaries	12,450 00	
Departmental Appropriation....	36 25	
	<hr/>	12,486 25
School of Law :		
Salaries	29,875 00	
Departmental Appropriation....	7 15	
	<hr/>	29,882 15
School of Political Science :		
Salaries	40,212 50	
Departmental Appropriation....	96 29	
	<hr/>	40,308 79
School of Medicine (COLLEGE OF PHY- SICIANS AND SURGEONS) :		
Educational Administration :		
Salaries	3,875 00	
General Administration :		
Office Supplies and Sundries....	688 78	
Printing and Postage on Cata- logue	1,867 97	
Alcohol	486 34	
Insurance	249 75	
Harsen Prize Fund.....	1,538 75	
Clark Scholarship.....	364 74	
Sloane Maternity Hospital....	12,500 00	
Commission on Sale of No. 333 West 31st Street	140 00	
	<hr/>	21,711 33
Carried forward.....		\$583,390 70

Brought forward.....		\$583,390 70
Buildings and Grounds (59th Street) :		
Wages, Boiler House and Janitorial Service.....	9,496 64	
Repairs, Furniture and Fixtures	2,457 33	
Fuel.....	3,963 18	
Cleaning	595 87	
Gas and Electricity.....	1,491 20	
Water Rates.....	696 80	
Refrigerating Plant.....	7,485 84	
Superintendent's Supplies.....	1,775 22	
Taxes, Insurance, Repairs, etc., of House No. 333 West 31st Street.....	122 22	
New 60th Street Addition....	1,005 00	
Electric Lighting North Wing...	112 43	
	<hr/>	29,201 73
Department of Anatomy :		
Salaries	11,320 00	
Departmental Appropriation....	2,598 14	
	<hr/>	13,918 14
Department of Chemistry and Physics:		
Salaries	11,776 80	
Departmental Appropriation....	2,038 42	
	<hr/>	13,815 22
Department of Clinical Instruction :		
Salaries		11,499 94
Department of Materia Medica and Therapeutics :		
Salaries	7,500 00	
Departmental Appropriation....	21 65	
	<hr/>	7,521 65
Department of Obstetrics and Gynecology :		
Salaries	8,500 00	
Departmental Appropriation....	96 61	
	<hr/>	8,596 61
Department of Pathology :		
Salaries	18,950 00	
Departmental Appropriation....	2,829 48	
	<hr/>	21,779 48
Carried forward.....		<hr/> \$689,723 47

Brought forward.....		\$689,723 47
Department of Physiology :		
Salaries	11,000 00	
Departmental Appropriation....	504 69	
	<hr/>	11,504 69
Department of Surgery :		
Salaries	8,500 00	
Departmental Appropriation....	259 73	
	<hr/>	8,759 73
Department of Practice of Medi- cine :		
Salaries		7,500 00
Museum :		
Supplies.....		449 59
		<hr/>
		<u>\$717,937 48</u>
Excess of Receipts over Disbursements :		\$29,698 14

GIFTS FOR OTHER THAN CURRENT USES.

From the Estate of the late President Barnard (Final Payment)	1,002 52
From the Estate of the late Mrs. President Barnard (Final Payment)	15,889 41
From the Estate of the late Hamilton Fish	50,000 00
From Seth Low for the Henry Drisler Classical Fund	10,000 00
	<hr/>
	\$76,891 93

GIFTS FOR CURRENT USES.

For the use of the Library :	
Samuel P. Avery	10,284 69
H. T. Imbrie	250 00
William Ziegler.....	1,000 00
Anonymous.....	20,000 00
A. C. Bernheim	100 00
W. C. Schermerhorn	5,000 00
Henry Adams... ..	1,000 00
	<hr/>
	37,634 69
From Alumni Association of the Col- lege of Physicians and Surgeons for Fellowship Stipends.....	1,500 00
From Samuel D. Babcock for an Annual Fellowship.....	500 00
From Miscellaneous Givers for Mis- cellaneous Objects.....	4,233 34
	<hr/>
	43,868 03
	<hr/>
	\$120,759 96

DISBURSEMENTS ON ACCOUNT OF NEW SITE FROM TIME
OF PURCHASE TO OCTOBER 9, 1894.

Payments on Account of Purchase.....	1,000,000 00
Legal Expenses.....	3,500 00
Architects' Studies.....	4,500 00
Miscellaneous Expenses.....	2,665 76
	<hr/>
	1,010,665 76
Less Discount on Advance Payments.....	4,833 33
	<hr/>
	\$1,005,832 43

RECEIPTS ON ACCOUNT OF NEW SITE FROM
TIME OF PURCHASE TO OCTOBER 9, 1894.

Henry C. Carter.....	150 00
Jacob H. Schiff.....	5,000 00
Samuel D. Babcock.....	5,000 00
Oswald Ottendorfer.....	5,000 00
William C. Schermerhorn.....	100,000 00
A. A. Low.....	15,000 00
Samuel Sloan.....	5,000 00
J. Pierpont Morgan.....	66,666 66
Cornelius Vanderbilt.....	100,000 00
D. Willis James.....	33,333 34
A. C. Bernheim.....	1,000 00
John A. King.....	1,000 00
Seth Low.....	5,000 00
Abram S. Hewitt.....	1,000 00
Morris K. Jesup.....	5,000 00
A. Corning Clark.....	10,000 00
Henry Parish.....	5,000 00
R. Fulton Cutting.....	10,000 00
	<hr/>
	373,150 00
Interest on Deposits.....	5,732 87
From Fayerweather Bequest	150,928 71
From Hamilton Fish Bequest...	50,000 00
From Joseph Pulitzer Gift.....	49,551 25
From Temporary Loan.....	200,000 00
From General Funds of the Col- lege.....	176,469 60
	<hr/>
	\$1,005,832 43

SCHEDULES OF FUNDS.

Gebhard Fund :

West Shore Railroad Co.'s Guaranteed 4 per cent. First Mortgage Bonds, due 2361.....	20,000 00
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McKim Fellowship Fund :

St. Paul, Minneapolis, and Manitoba Railroad Co.'s 4½ per cent. Consolidated Mortgage Bonds, due 1933.....	20,000 00
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Tyndall Fellowship Fund :

West Shore Railroad Co.'s Guaranteed 4 per cent. First Mortgage Bonds, due 2361.....	11,000 00
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Avery Architectural Fund :

Lehigh Valley Railroad Co.'s 4½ per cent. First Mortgage Bonds, due 1940.....	15,000 00
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Columbia Fellowship Fund :

Lehigh Valley Railroad Co.'s 4½ per cent. First Mortgage Bonds, due 1940	13,000 00
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Moffat Scholarship Fund :

St. Paul, Minneapolis, and Manitoba Railroad Co.'s 4½ per cent. Consolidated Mortgage Bonds, due 1933.....	2,000 00
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Schermershorn Scholarship Fund :

St. Paul, Minneapolis, and Manitoba Railroad Co.'s 4½ per cent. Consolidated Mortgage Bonds, due 1933.....	5,000 00
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Chanler Prize Fund ;

St. Paul, Minneapolis, and Manitoba Railroad Co.'s 4½ per cent. Consolidated Mortgage Bonds, due 1933.....	1,000 00
--	----------

Joseph F. Loubat Fund :

Buffalo, Rochester, and Pittsburg Railway Co's General Mortgage 5 per cent. Gold Bonds, due 1937.....	6,979 75	
Cash deposited with the New York Life Insurance and Trust Company, Balance of Fund at 3 per cent.....	20 25	
	<hr/>	<u>7,000 00</u>

Frederick A. P. Barnard Fund :

Bond and Mortgage on No. 64 East 111th Street, at 5 per cent., due July 17, 1892, for...	20,000 00	
Bond and Mortgage on property at Nos. 719 and 721 Ninth Street, N. Y. City, 6 per cent., due July 16, 1883, for.....	7,500 00	
Eight Coupon Bonds, B, of Pitkin Co., Colorado, at 6 per cent., \$500 each, Nos. 11 and 66 to 72 inclusive.....	4,000 00	
One Coupon Bond of the City of Leadville, Colorado, of \$1,000, at 8 per cent. No. 233, Series C.	1,000 00	
Buffalo, Rochester, and Pittsburg Railway Co.'s General Mort- gage 5 per cent. Gold Bonds, due September 1, 1937.....	10,960 57	
\$24,000 Illinois Central Railroad Co.'s 4 per cent. Gold Bonds of 1953, at 4 per cent., \$22,560, 1 month and 4 days' interest at 4 per cent., \$90 67.....	22,650 67	
Two Mortgage Deeds on Property at Litchfield, Conn., and Two Promissory Notes for \$3,500, at 5 per cent., and \$1,500 at 6 per cent.....	5,000 00	

71,111 24

Charles M. Da Costa Fund :

Central Railroad Co. of New Jersey 5 per cent. General Mortgage Bonds, due 1987	20,000 00	
New York, Lake Erie, and Western Railroad Co.'s (Docks and Improvements) 6 per cent. First Mortgage Bonds, due 1913	25,000 00	
New Jersey Junction Railroad Co.'s 4 per cent. First Mortgage Guaranteed Bonds, due 1986	25,000 00	
Lehigh Valley Terminal Railway Co.'s First Mortgage 5 per cent. Gold Bonds, due 1940 ..	10,000 00	
\$20,000 Pittsburgh, Chicago, Cincinnati, and St. Louis R.R. Co.'s Consolidated $4\frac{1}{2}$ per cent. Bonds, Series B	20,167 50	
	<hr/>	100,167 50

Wm. P. Trowbridge Fund :

Lehigh and Hudson Railroad Co.'s First Mortgage (6 per cent.) reduced to 5 per cent. Gold Bonds, due July 1, 1911.		10,231 94
		<hr/>

James Gordon Bennett Prize Fund :

\$1,000 West Shore Railroad Co.'s Guaranteed 4 per cent. First Mortgage Bond, due 2361, at 102 $\frac{7}{8}$		1,028 75
		<hr/>

Joseph Pulitzer Fund :

\$25,000 Niagara Falls Power Co.'s First Mortgage 5 per cent. Bonds at 90 flat	22,500 00	
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Brought forward....	22,500 00		
\$29,000 Manhattan Elevated Railway Co.'s 4 per cent. Consolidated Bonds at $96\frac{3}{8}$, including commission.....	27,948 75	50,448 75	
Cash.....		49,551 25	
			<u>100,000 00</u>
Joseph F. Loubat Prize Fund :			
Deposited with the New York Life Insurance and Trust Com- pany			<u>532 36</u>
Hamilton Fish Fund :			
Cash.....		50,000 00	
Drisler Classical Fund :			
Cash.....		10,000 00	
Margaret Barnard Fund :			
Cash.....		15,889 41	
Sloane Maternity Hospital Fund :			
Michigan Central Railroad Co.'s Detroit and Bay City First Mortgage 5 per cent. Bonds, due March 1, 1931.....	125,000 00		
Chicago and Northwestern Rail- way Co.'s 5 per cent. Sinking Fund Debenture Bonds, due May 1, 1933.....	125,000 00		
			<u>250,000 00</u>
Harsen Fund :			
28 Shares of United New Jersey Railroad and Canal Co.'s Stock of \$100 each at $227\frac{1}{8}$, includ- ing commission.....	6,382 25		
Bond and Mortgage on Property No. 17 East 45th Street, at $4\frac{1}{2}$ per cent.....	15,000 00		
Carried forward.....	21,382 25		

Brought forward.....	21,382 25	
Bond and Mortgage on Property corner 11th Avenue and West 34th Street, at $4\frac{1}{2}$ per cent...	9,835 00	31,217 25
Less Premium on Sale of New York City additional Croton Water Aqueduct 7 per cent. Stock.....		740 00
		<u>30,477 25</u>
Clark Scholarship Fund :		
17 shares of United New Jersey Railroad and Canal Co.'s Stock of \$100 each at $227\frac{1}{16}$, includ- ing commission.....	3,874 94	
Bond and Mortgage on Property No. 333 West 31st Street, New York City, at 5 per cent., due March 1, 1899, for.....	10,000 00	
Cash.....	125 06	14,000 00
		<u>14,000 00</u>
J. M. Smith Fund :		
11 Shares of United New Jersey Railroad and Canal Co.'s Stock of \$100 each, at $229\frac{3}{4}$, includ- ing commission.....		2,527 25
		<u>2,527 25</u>
Stevens Fund :		
9 Shares of United New Jersey Railroad and Canal Co.'s Stock of \$100 each at $227\frac{1}{16}$, includ- ing commission.....		2,051 44
		<u>2,051 44</u>

JOHN McL. NASH,
Treasurer of Columbia College.

